DRAFT RESPONSE TO COMMENTS ON
DRAFT FEASIBILITY STUDY REPORT, IR SITE 27, DOCK ZONE
ALAMEDA POINT, ALAMEDA, CALIFORNIA
DATED OCTOBER 2005
CTO-0069/0446

Comments from U.S. EPA, 1/23/2006

GENERAL COMMENTS	RESPONSE TO GENERAL COMMENTS
General Comment 1. It is unclear how the active remedies will address the shoreline groundwater, if at all. The bulkhead that runs through Site 27 is a key factor in dividing the salty, high TDS shoreline groundwater from the inland potential drinking water source quality groundwater. Therefore the bulkhead should be a component of the inland and the shoreline groundwater remedies.	**Response to General Comment 1.** Comment noted. Because of TDS values greater than 3,000 mg/L and proximity to Seaplane Lagoon, shoreline groundwater would be classified as Class III, as described in Section 2.4.6 of the FS Report; therefore, the Navy does not consider MCLs to be ARARs for shoreline groundwater. The following text has been added to the descriptions of each active alternative in Section 6: "Recent groundwater monitoring results indicate that VOCs in shoreline groundwater have attenuated to concentrations below RAOs. Therefore, no further action is proposed for shoreline groundwater. Sitewide groundwater monitoring (including selected shoreline wells as appropriate) would be conducted under Alternatives 3, 4A, 6A, and 7 to monitor the performance of the selected remedy for inland groundwater." Please refer to the response to Specific Comment 2 for a detailed response regarding the bulkhead as a component of the remedy.
General Comment 2. The alternative that evaluates ICs alone does not pass the threshold criteria for meeting ARARs, (MCLs), and should be eliminated from any evaluation.	**Response to General Comment 2.** Comment noted. Alternative 2 has been eliminated from further consideration in Section 5. Alternative 2 has been deleted from Sections 6 and 7. The first two sentences in the last paragraph in Section 5 have been revised as follows: "As shown in Table 5-2, Alternatives 2, 4B, 5, and 8 have been eliminated from further consideration. Alternative 2 has been eliminated based on low effectiveness, because no means would be provided to assess whether RAOs are achieved."

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GENERAL COMMENTS	RESPONSE TO GENERAL COMMENTS
General Comment 3. All alternatives appear unreasonably long in duration with the exception of Alternative 6B. In this FS, the evaluation of the short term effectiveness criterion focuses almost exclusively on risks to workers and residents during implementation of the remedy, but fails to also evaluate the short term effectiveness based on the duration of the remedy before RAOs are achieved. All alternatives, with the exception of 6B, rate poorly in this respect.	**Response to General Comment 3.** Regarding the rankings of alternatives under the criterion of short-term effectiveness, it is the Navy's opinion that the ranking of alternatives in the FS is consistent with the NCP. In 40 C.F.R. § 300.430(e)(9)(iii)(E)(4), one of the subcriteria for short-term effectiveness is "time until *protection* is achieved" (emphasis added). The Navy interprets this to mean the time required to achieve short-term protection, not the end point of an MNA process (achievement of RAOs). At IR Site 27, the Navy's interpretation is that alternatives with ICs that prohibit domestic use of groundwater achieve short-term protection when the ICs are instituted. Alternative 6B does not include ICs; the short-term protection is achieved with groundwater treatment, which also achieves RAOs.
General Comment 4. In analyzing cost, we recommend that the Navy consider the total cost as well as the net present value. For example, the total cost for Alternative 6A is higher than Alternative 6B, but that does not appear to be included in the analysis.	**Response to General Comment 4.** The duration of MNA for Alternatives 3, 4A and 6A is based on the highest historically observed concentrations and conservative BIOCHLOR modeling assumptions. The actual duration of MNA for these alternatives is expected to be considerably shorter. The NCP states the following regarding the cost criterion (40 C.F.R. § 300.430[e][9][G]): "The types of costs that shall be assessed include the following: (1) Capital costs, including both direct and indirect costs; (2) Annual operation and maintenance costs; and (3) Net present value of capital and O&M costs." Therefore, total cost is not evaluated.

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SPECIFIC COMMENTS	RESPONSE TO SPECIFIC COMMENTS
Executive Summary	
Specific Comment 1. Page ES-1, third paragraph, second sentence: It was EPA's understanding that data gap sampling for PCBs in the electrical substation and for VOCs and metals in soil and groundwater beneath the OWSs would also be included as part of the FS and the RD for Site 27. Please include these items in this section.	**Response to Specific Comment 1.** Comment noted. Please refer to the response to DTSC-GSU Specific Comment 2.
Specific Comment 2. Page ES-2, third complete sentence: As stated in General Comment #1, the continued maintenance of the bulkhead is critical to the implementation of the remedies for the inland groundwater and for the near shore groundwater.	**Response to Specific Comment 2.** The sheet pile bulkhead was installed without any cathodic protection, as part of the construction of this portion of Alameda Point. The Navy considers it unlikely that this structure will continue to provide a hydraulic barrier more than 70 years after its installation. What remains of the bulkhead may be acting as an unexpected permeable reactive barrier, providing zero-valent iron for abiotic reduction of chlorinated VOCs. Concentrations of VOCs have continued to decline, based on a review of ongoing monitoring program results. Remedial measures for inland groundwater are included in the active remedies in conjunction with monitoring (both shoreline and inland). The bulkhead is not considered to be critical to the implementation of any of the remedies.
Specific Comment 3. Page ES-2, Remedial Action Objectives: EPA does not agree that the RAOs should be only to protect existing uses, but that future beneficial uses should also be evaluated and protected.	**Response to Specific Comment 3.** The word "existing" has been deleted from the first two bullets under the Remedial Action Objectives heading in the Executive Summary and in Section 3.
Specific Comment 4. Page ES-3, third paragraph, second sentence: It is unclear what is meant by this sentence. Would ICs be necessary until MCLs are met? Please revise the wording.	**Response to Specific Comment 4.** Comment noted. The referenced sentence has been deleted. This paragraph has been revised to read as follows: "It is unlikely that future site occupants would extract groundwater for beneficial use at IR Site 27. However, for the purposes of this CERCLA cleanup, MCLs are potential ARARs for inland groundwater."

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SPECIFIC COMMENTS	RESPONSE TO SPECIFIC COMMENTS
Specific Comment 5. Page ES-4, Alternative 2: ICs cannot be modeled and would need to be in effect in perpetuity. What is really being discussed here is MNA which is Alternative 3. Please see General Comment #2 and delete Alternative 2 from the document.	**Response to Specific Comment 5.** Comment noted. Alternative 2 has been screened out, as described in the response to General Comment 2.
Specific Comment 6. Page ES-5, Alternative 6B: The duration for this alternative is missing from the description. The duration has been given for all other alternatives.	**Response to Specific Comment 6.** The last sentence under Alternative 6B in the Executive Summary has been replaced with the following: "The assumed duration for Alternative 6B is 3 years. This includes an assumed 25-day treatment period followed by 3 years of groundwater confirmation sampling to document post-ISCO-treatment VOC concentrations in groundwater."
Specific Comment 7. Page ES-6, second to last paragraph, last sentence: Please note that Alternative 2 does not satisfy the threshold criteria for compliance with ARARs and so is ineligible for selection. It should not be carried through the comparison with the other alternative.	**Response to Specific Comment 7.** Comment noted. Please refer to the response to General Comment 2.
SECTION 1	
Specific Comment 8. Section 1.1, Purpose, Page 1-1: The purpose of the Regulatory Agencies is not to review documents and provide comments as stated in the last paragraph on this page, but to provide regulatory oversight to ensure protection of human health and the environment. Please revise the last sentence to provide a more accurate description of the role of the Regulatory Agencies.	**Response to Specific Comment 8.** This sentence has been revised to read: "...(RWQCB) for comment as part of the CERCLA process."

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SPECIFIC COMMENTS	RESPONSE TO SPECIFIC COMMENTS
Specific Comment 9. Page 1-1, Section 1.1, first paragraph, third sentence: Please add a sentence after this one that states that data gap sampling to determine whether PCBs are present will be conducted post-FS.	**Response to Specific Comment 9.** The following sentence has been added after the third sentence in Section 1.1: "Data gap sampling will be conducted in the vicinity of two oil/water separators at IR Site 27 and in the washdown area, as part of the remedial design process, as discussed in the RI Report."
Specific Comment 10. Section 1.1, Purpose, Page 1-2: The date Alameda Point was placed on the National Priorities List (NPL) is not included. Please include the data Alameda Point was placed on the NPL.	**Response to Specific Comment 10.** The date of listing on the NPL (July 1999) has been added to the first paragraph on page 1-2 as follows: "Alameda Point was added to the U.S. EPA National Priorities List (ID number . . .) in July 1999."
SECTION 2	
Specific Comment 11. Section 2.3, Remedial Investigation and Other Relevant Investigations and Activities, Page 2-5: The text of the fourth bullet states that additional characterization at oil water separators (OWSs) OWS-166A and OWS-166B was recommended in the Remedial Investigation (RI) Report, but EPA comments also requested soil and groundwater sampling in the vicinity of OWS-601. The fact that there is no OWS at present in Building 601 is not sufficient to evaluate whether contaminants were released from this OWS. Please revise the FS to include soil and groundwater sampling in the vicinity of and beneath former OWS-601.	**Response to Specific Comment 11.** OWS 601 was installed above the ground around 1980, as described in Section 1.3.3 of the final RI Report. This unit has been closed and no further action is required (BEI 2005). The Navy will prepare an NFA recommendation letter regarding OWS-601 for DTSC concurrence. The following sentence has been added to the fourth bullet on page 2-5: "OWS-601 was an aboveground OWS inside Building 601 that has been closed; no further action is required."
Specific Comment 12. Page 2-12, second full sentence: We question the purpose of this sentence since the groundwater clearly meets the definition of a Class II aquifer and will be cleaned to MCLs.	**Response to Specific Comment 12.** The referenced sentence points out that drinking water supply wells are not likely to be installed at IR Site 27. The sentence does not affect the determination of MCLs as ARARs for inland groundwater.

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Specific Comment 13. Section 2.5.2, Analytical Results from Soil Samples, Page 2-13: The text of the second bullet indicates that the maximum detected concentration of benzene in soil was 600 micrograms per kilogram (ug/kg), but according to the RI Report, the maximum concentration of benzene was 660 ug/kg. Please resolve this discrepancy.	**Response to Specific Comment 13.** The typographical error in the second bullet has been corrected to indicate that 660 µg/kg is the maximum detected concentration of benzene in soil.
Specific Comment 14. Page 2-14, fifth bullet: The fact that arsenic is above MCLs will need to be addressed as part of the remedial action. Background for arsenic is around 3 ug/l, well below the federal MCL, so the arsenic present in the groundwater at Site 27 is due to site activities and an RAO of 10ug/l must therefore be set for the arsenic. The Navy believes that remediating the VOC plumes will serve to reduce arsenic concentrations. Nonetheless, an RAO for arsenic must still be included as part the evaluation of remedial alternatives, and as a performance measure for remedy effectiveness.	**Response to Specific Comment 14.** Arsenic concentrations (maximum 23.9 µg/L) in inland groundwater exceeded the MCL of 10 µg/L. Arsenic has been added to Table 3-1 as a COC for inland groundwater with an RAO of 10 µg/L. Arsenic concentrations in shoreline groundwater do not exceed surface water comparison criteria, so arsenic is not considered a COC for shoreline groundwater. Please refer also to the response to DTSC-OMF and HERD General Comment 1.
Specific Comment 15. Section 2.5.3, Analytical Results from Groundwater Samples, Page 2-14: The text identifies only 5 VOCs at concentrations above the maximum contaminant levels (MCLs), but 8 VOCs were identified in the RI Report as exceeding the MCLs. In addition to the VOCs listed in bullets 3 and 4, benzene, PCE, and 1,1-dichloroethane (1,1-DCA) also exceeded their respective MCLs. Please revise the FS to state that concentrations of benzene, PCE, and 1,1-DCA also exceeded MCLs.	**Response to Specific Comment 15.** To account for benzene, 1,1-DCA, and PCE, which exceeded MCLs only in shoreline wells, a third bullet under "...shoreline wells..." in Section 2.5.3 has been added as follows: • "five chlorinated VOCs (1,1-DCA; cis-1,2-DCE; PCE; TCE; and vinyl chloride) and one fuel-related VOC (benzene) at concentrations exceeding MCLs; however, due to high TDS in groundwater at the shoreline, MCLs are not applicable comparison criteria for shoreline groundwater"

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SPECIFIC COMMENTS	RESPONSE TO SPECIFIC COMMENTS
Specific Comment 16. Section 2.5.3.1, Shoreline Wells, Pages 2-14 and 2-15: The text states that the concentration of arsenic in groundwater did not exceed the California Toxics Rule (CTR), but the maximum concentration of arsenic (38 milligrams per liter [mg/l]) did exceed the CTR saltwater continuous concentration criterion of 36 mg/l). There are no CTR criteria for beryllium, iron, and molybdenum, so it is not correct to state that they did not exceed the CTR criteria. In addition, the concentration of mercury exceeded the CTR based on the San Francisco Bay Basin Plan. Please revise the text to state that arsenic and mercury were detected above CTR criteria and that there are no CTR criteria for beryllium, iron, and molybdenum.	**Response to Specific Comment 16.** The maximum arsenic concentration reported from any well at IR Site 27 was 23.9 µg/L from inland well 15-MW3. Therefore, arsenic did not exceed the CTR comparison criterion for shoreline wells or for any well at IR Site 27. These data are posted on Figure 4-13 in the RI Report (BEI 2005). For discussion of the remaining metals reported in groundwater from shoreline wells, the text has been revised. Section 2.5.3.1, second paragraph, third and fourth sentences, have been revised as follows: "Of these five metals, only arsenic and selenium have CTR criteria, and neither of these metals was reported at concentrations exceeding CTR criteria in samples from shoreline wells. Five metals (copper, lead, mercury, nickel, and zinc) were reported at concentrations exceeding CTR criteria; however, concentrations of these metals were not statistically different from Alameda Point background concentrations."
Specific Comment 17. Page 2-17, first full paragraph, second to last sentence: Like arsenic, MTBE will need to be addressed as part of the remedial action and the federal MCL of 13 ug/l must be included as an RAO.	**Response to Specific Comment 17.** Samples from four wells (15-MW1, 15-MW2, 15-MW3, and 27MW06) at IR Site 27 are being analyzed for MTBE as part of the basewide groundwater monitoring program (BGMP). Since the summer 2002 BGMP sampling event, 2 of 46 samples have contained concentrations which exceeded the MCL of 13 µg/L. In the two most recent monitoring events for which results are available (spring and summer 2005), none of the eight samples from the four wells contained MTBE at concentrations above the MCL (ITSI 2005, 2006). The Navy plans to conduct several additional monitoring events for MTBE as part of the BGMP. Since MTBE has not been detected recently at IR Site 27 at concentrations above the MCL, it is not appropriate to include the MCL for MTBE as an RAO.

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Specific Comment 18. Page 2-21, second sentence after first set of bullets: We continue to think it unlikely that Sites 19 and 22 would be potential sources for this groundwater plume since the concentrations at these sites are less than those found at the plume hot spots within Site 27.	**Response to Specific Comment 18.** The second, third, and fourth sentences in the fourth paragraph of Section 2.8 have been replaced with the following: "A less likely potential source is the migration of a hypothetical slug of VOCs released to groundwater upgradient of IR Site 27. VOCs have been reported in groundwater samples from IR Sites 19 and 22. However, reported VOC concentrations at these sites do not appear likely to indicate an off-site source."
SECTION 4	
Specific Comment 19. Page 4-8, Section 4.3.4.2: Has it been demonstrated that the degradation can continue past VC? This step is critical for MNA to be successfully adopted as a remedial measure.	**Response to Specific Comment 19.** In the shoreline area, a longer monitoring history is available for monitoring wells, and evidence of degradation past VC has been documented. For inland groundwater, the monitoring history is not sufficient to conclusively document VC degradation. MNA monitoring continues at IR Site 27; therefore, additional data will be available for decision makers to assess VC degradation in inland groundwater prior to the proposed plan and ROD. Please refer to the response to Specific Comment 28.
Specific Comment 20. Page 4-13, first bullet: Please clarify how the odor threshold can be lower than the detection limit for hydrogen sulfide gas.	**Response to Specific Comment 20.** The odor threshold for hydrogen sulfide in the literature varies from 0.0005 to 0.01 parts per million by volume (ppmv). ATSDR reports an odor threshold of 0.0005 ppmv (ATSDR 2006). Field instruments are not capable of detecting hydrogen sulfide at this concentration.

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Specific Comment 21. Section 4.3.8.4, In-Situ Chemical Oxidation, Page 4-19: The text of the third paragraph implies that interference from competing reactions is not a factor for Fenton's reagent, but there are more competing reactions when Fenton's reagent is used than there are when potassium permanganate is used. Please revised this paragraph to clarify that competing reactions occur when Fenton's reagent is used.	**Response to Specific Comment 21.** Competing reactions are described in the sixth bullet on page 4-20. The following sentence has been added after the third sentence in the fifth paragraph under the In-Situ Chemical Oxidation heading in Section 4.3.8.4: "Like permanganate, the optimum dose rate for Fenton's reagent will depend on the number of competing reactions in the aquifer."
Specific Comment 22. Section 4.3.8.4, In-Situ Chemical Oxidation, Pages 4-19 and 4-20: Fire and explosion can occur when Fenton's reagent is used in the presence of flammable vapors in the subsurface. The presence of benzene, pentane, hexane, and other volatile and flammable petroleum compounds in soil and groundwater suggests that this potential exists if traditional Fenton's reagent is used at Site 27. Discussion of the potential for fire and explosion when traditional Fenton's reagent is used will strengthen the case for using modified Fenton's reagent. Please revise the text to include a discussion of the potential for fire and/or explosion and specify that only modified Fenton's reagent can be used.	**Response to Specific Comment 22.** The following text has been added to the end of the fourth paragraph under the In-Situ Chemical Oxidation heading in Section 4.3.8.4: "The presence of hydrocarbons can pose a potential fire and explosion risk with traditional Fenton's reagent chemistry. At IR Site 27, hydrocarbons have been reported in soil and groundwater. The use of modified Fenton's chemistry would pose a lesser risk of fire or explosion because of the lower temperature produced in the aquifer."
SECTION 5	
Specific Comment 23. Page 5-2, Section 5.1.2: Please delete this alternative from consideration.	**Response to Specific Comment 23.** Alternative 2 has been screened out in Section 5 and deleted from Sections 6 and 7. Please see the response to General Comment 2.

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SPECIFIC COMMENTS	RESPONSE TO SPECIFIC COMMENTS
Specific Comment 24. Section 5.1.5, Alternative 4B - Sitewide ISB Treatment, MNA, and ICs, Page 5-4 and Figure 5-1, Assumed Treatment Approach for Alternative 4B: Based on Figure 5-1, one of the two hot spot areas would not be treated, so it is not evident that this alternative would be implemented across the entire site as stated in the text. Please revise Figure 5-1 to include the injection points within the hot spots.	**Response to Specific Comment 24.** Alternative 4B includes the same hot spot treatment described under Alternative 4A, followed by (or concurrent with) installation of the seven treatment barriers. To clarify this point, the 128 source area injection points have been added to Figure 5-1.
Specific Comment 25. Section 5.1.7, Alternative 6A, Page 5-5: The number of injection points is not specified as it is for the other alternatives. Please specify the number of injection points.	**Response to Specific Comment 25.** The following text has been inserted before the last sentence in the first paragraph in Section 5.1.7: "Alternative 6A would employ an estimated 43 injection points in the western treatment area, and 57 injection points in the eastern treatment area, for an estimated total of 100 injection points."
Specific Comment 26. Page 5-7, Section 5.2: Please delete the second bullet on this page. Also, the reasons for eliminating Alternative 4B appear to be cost alone since Alternative 6B was retained and has even more injection points (570) than 4B.	**Response to Specific Comment 26.** Alternative 2 has been included and screened out in Section 5, as described in the response to General Comment 2. The second bullet has been deleted. The following text has replaced the rationale for the elimination of Alternative 4B in the last paragraph of Section 5.2: "Alternative 4B was eliminated, based on a comparison with other alternatives. Alternative 4B has higher costs than Alternative 6B, a longer duration (an assumed 5 years of MNA), and a need for ICs."
Specific Comment 27. Section 5.2, Screening of Remedial Alternatives, Pages 5-7 and 5-8, and Table 5-2, Screening Results for Remedial Alternatives: The statement that Alternative 8 was eliminated because it is difficult to inject zero-valent iron (ZVI) into shallow groundwater is unsupported. ZVI has been injected into shallow groundwater at Hunters Point Shipyard and other alternatives require	**Response to Specific Comment 27.** The ZVI process involves a slurry injection into the aquifer. This injection process must occur at a pressure sufficient to create fractures in the soil matrix. Based on a recent conversation with a ZVI vendor, ZVI injection into shallow groundwater at IR Site 27 is not advisable. The vendor recommended physical mixing (blending) with an excavator or similar means instead. This additional justification for screening out ZVI has replaced the last sentence in Section 5.2:

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SPECIFIC COMMENTS	RESPONSE TO SPECIFIC COMMENTS
Specific Comment 27 (continued). injection into shallow groundwater. Further, the ZVI injection pressure can be adjusted. Alternative 8 should be retained unless further justification is provided. In addition, Alternative 4B was eliminated because it was deemed difficult to implement 440 injection borings, but Alternative 6B, which involves 570 injection borings and a second round of up to 285 injection borings was retained. Please retain Alternative 8 or provide better justification for eliminating it. Please also retain alternative 4B or provide a better explanation for its elimination.	**Response to Specific Comment 27 (continued).** "Alternative 8 was eliminated because of the difficulty in injecting ZVI slurry into shallow groundwater (6 feet bgs) with coarse-grained soils (ARS 2006)." The screening discussion and rationale for rejection of Alternative 4B has been revised to include additional reasons for its elimination in the fourth paragraph of Section 5.2 as follows: "Alternative 4B was eliminated based on comparison with other alternatives. Alternative 4B has higher costs than Alternative 6B, a longer duration (an assumed 5 years of MNA), and a need for ICs."
Specific Comment 28. Table 5-2: Please eliminate Alternative 2. What is being evaluated in this table under Alternative 2 is really MNA which is Alternative 3. In addition, please remove phrases such as "MNA would continue at the site, based on lines of evidence." The lines of evidence have not been established, as acknowledged on page 4-6, so it is unknown whether MNA is occurring, or continuing, and certainly this factor counts against selecting MNA as a remedial alternative.	**Response to Specific Comment 28.** Discussions about declining VOC concentrations, MNA, and the BIOCHLOR model have been deleted from Section 5.1.2. The sixth sentence in the first paragraph, and the entire third paragraph of Section 5.1.2, have been deleted. The second paragraph has been moved to Section 5.1.3. The following sentence has been added to the end of the first paragraph of Section 5.1.2: "ICs would have an assumed duration of 70 years." The Navy believes that sufficient evidence is available in the final RI Report and basewide groundwater monitoring program results to conclude that natural attenuation is occurring. Additional site-specific discussion and data regarding lines of evidence have been added to Section 4.3.4.1. Please refer to Attachment 1* for the text of the revised Section 4.3.4.1, including two new figures and a new table. * the contents of this attachment have been incorporated into the draft final Feasibility Study Report, and are therefore not reproduced here

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SECTION 6	
Specific Comment 29. Page 6-1, second paragraph, second sentence: Please revise to state "Natural attenuation processes may be reducing some VOC concentrations in groundwater..."	**Response to Specific Comment 29.** Two sentences in the second paragraph have been replaced with the following text: "Under the BGMP, the Navy is currently collecting analytical data for natural attenuation parameters for IR Site 27, as discussed in Section 4.3.4.1. Based on the interpretation of these results, natural attenuation processes have reduced VOC concentrations at the site, and continued reduction is expected to occur. No other remedial actions have taken place for VOCs in groundwater at IR Site 27."
Specific Comment 30. Page 6-4, Section 6.1.5, last bullet: The duration period to achieve RAOs has not been sufficiently evaluated in comparing the alternatives. All alternatives except Alternative 6B take in excess of 30 years to achieve RAOs and so should rate poorly in meeting the short term effectiveness criterion.	**Response to Specific Comment 30.** The word "RAOs" in the last bullet on page 6-4 (Section 6.1.5) has been replaced with "protection" to be consistent with NCP language. Please refer to the response to General Comment 3 regarding short-term effectiveness.
Specific Comment 31. Page 6-6, Section 6.3.1.1: The groundwater footprint subject to ICs prohibiting extraction of groundwater would need to be larger than depicted on Figure 6-1. It would be necessary to ensure that no wells are located outside the plume area that could potentially draw the contaminated groundwater beyond the plume boundaries.	**Response to Specific Comment 31.** The footprint shown on Figure 6-1 of the draft FS Report indicates the extent of inland groundwater exceeding MCLs, based on Hydropunch data. For FS purposes, it has been assumed that no domestic wells will be permitted in this area at IR Site 27. Chemical concentrations in groundwater from shallow (10 feet bgs) Hydropunch samples near the edge of the footprint are at or near MCLs, and deeper groundwater that is likely to be extracted is presumed to contain concentrations below MCLs. Assuming that any domestic well would have a sanitary seal of at least 20 feet, the footprint shown should be protective for FS purposes. Details of the groundwater ICs will be developed in the remedial design stage.

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Specific Comment 32. Page 6-7, Section 6.3.1.2: EPA would require at a minimum annual reviews and reports of the effectiveness of the ICs for all remedies. The additional cost associated with annual reporting, rather than the five year reporting period used in the document, should be factored into all remedies with ICs as a component.	**Response to Specific Comment 32.** Alternatives with an IC component include annual IC maintenance and reporting costs of $10,000 per year. The specific activities associated with IC maintenance would be established in the remedial design stage.
Specific Comment 33. Section 6.3 1.2, Periodic Reviews, Page 6-7; Section 6.3.2.5, Short-Term Effectiveness, Page 6-8; and Section 6.3.2.7, Cost, Page 6-8: It is not appropriate to assume that ICs would only be in place for 70 years. Since groundwater monitoring is not included in Alternative 2, it cannot be assumed that attenuation is occurring, attenuation cannot be verified, and ICs must remain in place for perpetuity.	**Response to Specific Comment 33.** Alternative 2 has been screened out in Section 5 and deleted from Sections 6 and 7. Please refer to the response to General Comment 2.
Specific Comment 34. Page 6-7, Section 6.3.2.2: The logic used in this section is in error in that apparently only action-specific ARARs have been evaluated here. The alternatives have to comply with all ARARs (in this case MCLs).	**Response to Specific Comment 34.** Alternative 2 has been screened out in Section 5 and deleted from Sections 6 and 7. Please refer to the response to General Comment 2.
Specific Comment 35. Page 6-8, Section 6.3.2.4: Please remove this section, and the entire Alternative 2. What is being evaluated here is MNA. Further, statements such as "passive treatment of chlorinated VOCs through natural processes would continue to occur" are unsubstantiated and should be deleted.	**Response to Specific Comment 35.** Alternative 2 has been screened out in Section 5 and deleted from Sections 6 and 7. Please refer to the response to General Comment 2 and Specific Comment 28.
Specific Comment 36. Page 6-9, Section 6.4.1, third bullet: There cannot be an upward vertical hydraulic gradient at this site and therefore this claim cannot be used as a reason for not considering protection of the deeper aquifer necessary. (See my comment with regard to Site 9 and the Navy's subsequent deletion of this claim).	**Response to Specific Comment 36.** The phrase in the third bullet in Section 6.4.1 (now Section 6.3.1) referring to an upward vertical hydraulic gradient has been deleted.

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Specific Comment 37. Section 6.4.1.1, Monitoring Program Design For MNA, Page 6-10: The FS states that groundwater will be sampled from eight wells, but it is not clear if additional wells are proposed or if the monitoring program design includes only the existing wells. Furthermore, it is not clear that the existing wells at IR Site 27 are adequate to monitor the migration and attenuation of the volatile organic compounds (VOCs). Areas to the north and south of the main axis of the plume are not covered by the existing monitoring network. Please revise the monitoring alternatives in the FS to include additional wells to monitor these areas, or clarify why additional wells were deemed unnecessary.	**Response to Specific Comment 37.** If additional monitoring wells are needed, the number, location and placement of these wells will be developed at the remedial design stage. For the purposes of this FS Report, additional monitoring wells do not have a significant impact on the comparative analysis of alternatives.
Specific Comment 38. Section 6.5.1, Description of Alternative (4A), Page 6-12 and Section 6.6.1.1, In-Situ Chemical Oxidation, Page 6-17: Since amendments will be injected into the subsurface, it is possible that portions of the plume will be displaced, but there are no monitoring wells north and south of the main axis of the plume to monitor displacement. Please revise these alternatives to include installation of additional wells to monitor potential plume displacement.	**Response to Specific Comment 38.** Please refer to the response to Specific Comment 37 regarding additional wells. New and existing wells can be used to monitor plume displacement. While the actual dose rates will be determined in the remedial design, additional details about the assumed injection volumes and possible plume migration have been included in discussions of Alternatives 4A, 6A and 6B in Section 6. The following sentence has been added to the first paragraph in Section 6.5.1.1 (now Section 6.4.1.1): "The assumed dose rate for HRC is 120 pounds per injection point." The following text has been added to the first paragraph in Sections 6.5.1.1 and 6.6.1.1: "The assumed dose rate for ISCO is 300 gallons per injection point. Measures to minimize possible plume migration during injection would be developed in the remedial design stage."

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SPECIFIC COMMENTS	RESPONSE TO SPECIFIC COMMENTS
Specific Comment 39. Page 6-13, first two bullets: EPA questions the intent of these two bullets. Firstly, hydropunch data yields discrete, rather than average, concentrations and the model should use the highest concentration values to determine the duration of clean up. Secondly, MCLs are ARARs and should be used as the end point calculation for plume clean up. It is not conservative but, rather, required. We are also confused by the sentence immediately following the bullets and would like an explanation of why ICs would be released prior to achieving ARARs.	**Response to Specific Comment 39.** The BIOCHLOR model utilized the highest concentrations from the Hydropunch values in predicting the duration of MNA. The second and third paragraphs (including the bullets) in Section 6.5.1 (now Section 6.4.1) have been deleted (including the reference to the release of ICs) and replaced with the following: "BIOCHLOR model simulations (Appendix B) performed for this alternative indicate that VOC concentrations should attenuate to RAOs within 60 years after source area treatment. This model is conservative because it is based on the highest VOC concentrations observed at IR Site 27. However, the BIOCHLOR modeling result of 60 years is adequate for comparison purposes. The assumed end point (i.e., MCLs) may be achieved sooner, in which case the ICs would be discontinued."
Specific Comment 40. Page 6-17, Section 6.6.1: See above comment.	**Response to Specific Comment 40.** The same change and revision described in the response to Specific Comment 39 has been made in the appropriate sections throughout the text of the FS Report.
Specific Comment 41. Section 6.7.1.3, Closeout Report, Page 6-22: The text states that a periodic review would not be required because Alternative 6B has a duration of 2 years, but a Five-Year Review is still required, in addition to the closeout report. In addition, some monitoring beyond the two year period would probably be required to verify that there is no rebound in VOC concentrations.	**Response to Specific Comment 41.** The following clarification has been added to the text of Section 6.7.1.3 (now Section 6.6.1.3) regarding the need for a 5-year review (italics indicate added text): "Because *ISCO treatment is assumed to reduce VOC concentrations to levels below RAOs within 6 months, and* Alternative 6B has a duration of only 3 years, periodic reviews would not need to be performed every 5 years..." One annual groundwater monitoring event at year 3 has also been added to the groundwater confirmation sampling program for Alternative 6B.

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SPECIFIC COMMENTS	RESPONSE TO SPECIFIC COMMENTS
Specific Comment 42. Page 6-23, Section 6.7.2.5: The correct logic is applied in this section in evaluating short term effectiveness. The the same logic should be applied to all other alternatives.	**Response to Specific Comment 42.** Alternative 6B is the only alternative that does not include ICs; the short-term protection is achieved with sitewide ISCO treatment. Please refer to the response to General Comment 3.
Specific Comment 43. Section 6.8.1.1, Remediation System Construction, Page 6-24: Granular activated carbon (GAC) is not effective for treating vinyl chloride, which is present in groundwater at this site. Since detection of vinyl chloride would be interpreted as break-through, GAC would likely be changed out frequently, which would add to the cost of this alternative. Please revise this alternative to propose treatment that would remove vinyl chloride.	**Response to Specific Comment 43.** The Navy acknowledges that granular activated carbon has a lower affinity for vinyl chloride than other chlorinated VOCs. However, based on the low concentrations of vinyl chloride in soil gas and groundwater, granular activated carbon is assumed to be adequate for FS purposes. Daily monitoring is assumed to be conducted for the first month, followed by weekly monitoring to track carbon vessel consumption.
Specific Comment 44. Figure 6-1, Assumed Extent of Institutional Controls: The extent of institutional controls (ICs) as shown on this figure, appear to extend to exactly the limits of the VOC plume. It appears that if domestic use of groundwater is allowed outside this boundary, wells could be placed close enough to the plume to draw contaminants. Please revise the extent of ICs to provide an adequate buffer to be protective if wells were to be installed just outside the boundary.	**Response to Specific Comment 44.** Please refer to the response to Specific Comment 31.
SECTION 7	
Specific Comment 45. Page 7-2, Section 7.2: Please remove Alternative 2 from this list since it does not comply with ARARs.	**Response to Specific Comment 45.** Alternative 2 has been screened out in Section 5 and deleted from Sections 6 and 7. Please refer to the response to General Comment 2.

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SPECIFIC COMMENTS	RESPONSE TO SPECIFIC COMMENTS
Specific Comment 46. Page 7-3, Section 7.3, last paragraph: Alternatives 4A and 6A, taking 45 and 55 years respectively to achieve RAOs, do not appear to significantly shorten the IC time frame.	**Response to Specific Comment 46.** The BIOCHLOR model used the highest observed VOC concentrations at IR Site 27 to calculate durations for MNA in the two plume areas for comparison purposes. The actual time to reach RAOs may be shorter because of the conservative nature of this model.
Specific Comment 47. Page 7-4, Section 7.5: Alternative 2 should be removed since it cannot be shown to achieve RAOs and doesn't meet ARARs. Alternative 3 takes 70 years to achieve RAOs and so, even though it is easy to implement, it doesn't satisfy the short term effectiveness criterion from a duration to reach RAOs standpoint.	**Response to Specific Comment 47.** Please refer to the responses to General Comments 2 and 3.
Specific Comment 48. Page 7-6, Section 7.10: Please note that Alternative 2 also fails to meet the threshold criteria.	**Response to Specific Comment 48.** Please refer to the response to General Comment 2.
Specific Comment 49. Section 7.7, Cost, Page 7-6: This section and Table 7-1 rank alternatives according to the magnitude of cost (e.g., low cost ranks low, high cost ranks high); however, from an FS perspective, low cost is more desirable than high cost, therefore the rankings should be reversed.	**Response to Specific Comment 49.** The rankings have been reversed and explained in Section 7.7 and Table 7-1.

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SPECIFIC COMMENTS	RESPONSE TO SPECIFIC COMMENTS
	References for Specific Comments: Agency for Toxic Substances and Disease Registry. 2006. At www.atsdc.cdc.gov/toxprofiles/tp114.html. ATDSR. *See* Agency for Toxic Substances and Disease Registry. ARS Technologies, Inc. (At www.arstechnologies.com.) 2006. Telephone conversation between S. Drugan (BEI) and S. Chen (ARS) regarding ZVI injection technology applicable at IR Site 27. February 9. Bechtel Environmental, Inc. 2005. Draft Final Remedial Investigation Report, IR Site 27, Dock Zone, Alameda Point, Alameda, California. July. BEI. *See* Bechtel Environmental, Inc. Innovative Technical Solutions, Inc. 2005. Spring 2005 Alameda Basewide Groundwater Monitoring Report. Alameda Point, Alameda, California. July. ———. 2006. Telephone conversation between A. Acharya (ITSI) and M. Dermer (BEI) regarding groundwater monitoring analytical results from summer 2005. February 23. ITSI. *See* Innovative Technical Solutions, Inc.

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ADDITIONAL COMMENTS	RESPONSE TO ADDITIONAL COMMENTS
Additional Comment 1. Page ES-7, last paragraph and Section 7.10, page 7-6, Comparison of rating of alternatives. The summary comparison of alternatives is not entirely appropriate at the FS stage; moreover, it is not explained how the comparison was made. It is also misleading: for example, it suggests there is a major difference between Alternatives 6A and 6B, apparently without considering factors such as Alternative 6B's lower total cost. We recommend omitting the summary comparison.	**Response to Additional Comment 1.** The Navy's position is that a comparative presentation of the alternatives is appropriate for review by the agencies and community at the FS stage, and is required by the NCP (§ 300.430[e][9][i] and [iii]).
Additional Comment 2. Page ES-6 indicates that all alternatives except for Alternative 1 (no action) meet threshold criteria. EPA disagrees. Alternative 2 (ICs) does not meet ARARs because MCLs will not be achieved. [Same comment for page 7-2].	**Response to Additional Comment 2.** Please refer to the response to General Comment 2.
SECTION 3, RAOs	
Additional Comment 3. Page 3-1, general RAOs, first bullet: Please remove the phrase "to the extent practicable".	**Response to Additional Comment 3.** The phrase "to the extent practicable" has been deleted from the first bullet on page 3-1.
Additional Comment 4. Section 3.4, page 3-7, last paragraph, discussion of dilution. EPA is not convinced that use of a mixing zone/dilution analysis is appropriate to determine compliance with the CTR numbers that are proposed as RAOs for the shoreline groundwater. We prefer measuring compliance with CTR standards at the point where the groundwater discharges to the surface water.	**Response to Additional Comment 4.** The Navy has determined that shoreline groundwater already meets the RAOs before entering the surface water. Therefore, the consideration of dilution in a mixing zone for IR Site 27 is not necessary, since the surface water RAOs are already met in groundwater. Please see the response to RWQCB Specific Comment 7.

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ADDITIONAL COMMENTS	RESPONSE TO ADDITIONAL COMMENTS
SECTION 5, Development and Screening of Remedial Alternatives	
Additional Comment 5. EPA disagrees with retention of the IC remedy since it will not meet ARARs (MCLs). Additionally, the discussion of the IC remedy relies heavily on MNA. Since MNA/ICs is presented as a separate alternative, it is unnecessary to retain the IC remedy.	**Response to Additional Comment 5.** Alternative 2 has been screened out in Section 5 and deleted from Sections 6 and 7. Please refer to the response to General Comment 2.
Additional Comment 6. It is not clear whether the alternatives discussed in this chapter are aimed at the shoreline groundwater as well as the inland groundwater. For example, Alternative 6B, page 5-5, is described as aggressively treating "the entire IR Site 27 inland groundwater plume," but there is no discussion of whether this alternative would also address the shoreline groundwater.	**Response to Additional Comment 6.** Because shoreline groundwater already meets RAOs, no active treatment is proposed for this area. Please refer to the response to General Comment 1.
SECTION 6, Detailed Analysis of Remedial Alternatives	
Additional Comment 7. Section 6.3.1.2, page 6-7, periodic reviews of ICs. EPA does not consider reviews every five years to be sufficient, and would require at least annual monitoring to ensure that ICs are being implemented effectively.	**Response to Additional Comment 7.** Please refer to the response to Specific Comment 32.
Additional Comment 8. Section 6.3.2.1, page 6-7, Alternative 2, Overall Protectiveness Criterion. It is unclear how this criterion addresses the general response objective of protecting existing beneficial uses of surface water adjacent to IR Site 27. The same comment applies to other alternatives where there is inadequate discussion of the shoreline groundwater.	**Response to Additional Comment 8.** Please refer to the responses to General Comment 1 and Specific Comment 3.

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Additional Comment 9. Section 6.3.2.2, page 6-7, Alternative 2, Compliance with ARARs. Elsewhere in the document, MCLs are included as ARARs for the inland groundwater. This alternative will not comply with those ARARs.	**Response to Additional Comment 9.** Please refer to the response to General Comment 2.
Additional Comment 10. Section 6.3.2.7, page 6-8. Alternative 2, Cost. The cost would have been higher to cover monitoring of the ICs at least annually.	**Response to Additional Comment 10.** Please refer to the responses to General Comment 2 and Specific Comment 32.
Additional Comment 11. Section 6.5.1, page 6-13. EPA disagrees with the statement that the regulatory agencies may accept a less stringent end point for ICs if sufficient data are collected to show that attenuation is continuing. ICs would need to continue until MCLs are attained. We have a similar comment for the similar discussion on page 6-17 and 6-24.	**Response to Additional Comment 11.** Reference to the early release of ICs has been deleted from this section. Please refer to the response to Specific Comment 39.
APPENDIX A, ARARs	
Additional Comment 12. Page A2-7, and Table A2-2, Page 2, ACLs. The Navy should consider the new OSWER Memorandum 9200.4-39, Use of Alternative Concentration Limits (ACLs) in Superfund Cleanups, in deciding whether to include ACLs. EPA also questions why the Navy is including the ACL discussion at all – specifically, what are the otherwise applicable concentration limits? Does the Navy consider the CTR requirements to be ARARs for the shoreline groundwater?	**Response to Additional Comment 12.** The referenced OSWER directive is not a potential ARAR. Although the site does seem to meet the criteria for using CERCLA ACLs as stated in the cited OSWER memorandum, ACLs are not necessary since it has been determined that the shoreline groundwater is not a potential drinking water source where MCLs would be potential ARARs. The text and associated table of the ARARs analysis in Appendix A has been revised to include this determination. The Navy does not consider CTR requirements as an ARAR for shoreline groundwater. However, CTR requirements were identified as potential surface water ARARs since groundwater is flowing toward the surface water.

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Additional Comment 13. Page A2-13, discussion of dilution. See comment above. Additionally, it is not appropriate to rely on provisions of the California Ocean Plan, which does not apply to the Seaplane Lagoon.	**Response to Additional Comment 13.** See response to Additional Comment 4 above. Reference to the Ocean Plan has been removed.
Additional Comment 14. Page A2-16. It is confusing and inaccurate to refer to the "Policy for Implementation of Toxic Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California" as Phase 1 of the Inland Surface Waters Plan" or as the "Inland Surface Waters Plan," as the ISWP was a separate plan that was rescinded by the State Board many years ago in response to a court ruling. EPA generally refers to the document identified as SWRCB 2000 as the "SIP," and would suggest something like the "Toxic Standards SIP" to refer to this document.	**Response to Additional Comment 14.** The reference to the SIP has been revised to exclude "Phase 1 of the Inland Surface Waters Plan" and "Inland Surface Waters Plan."
Additional Comment 15. Section. A3.2.4.1, page A3-8, ESA. EPA disagrees with the characterization of consultation regulations as possible TBCs, because TBCs generally refer to nonpromulgated or otherwise not legally-enforceable substantive standards or criteria. EPA nevertheless recommends that consultation regulations be complied with when appropriate.	**Response to Additional Comment 15.** The text has been revised to exclude TBCs from the discussion. Instead, the guidance has been included as suggested.
Additional Comment 16. Table A2-2, page 3. It is unclear why surface water ARARs are included. We presume it is because the shoreline groundwater may impact surface water. Please clarify.	**Response to Additional Comment 16.** Clarification has been added that surface water ARARs are included because shoreline groundwater is in contact with surface water, and groundwater generally flows toward Seaplane Lagoon. The following sentence has been added after the third sentence in Section A2.1.2: "Surface water ARARs were evaluated because shoreline groundwater is in contact with Seaplane Lagoon, and groundwater generally flows toward the surface water at IR Site 27."

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ADDITIONAL COMMENTS	RESPONSE TO ADDITIONAL COMMENTS
Additional Comment 17. Table A2-2, page 4. It is unclear why water quality standards and effluent limitations are discussed. Is it anticipated that there will be a discharge to Seaplane Lagoon? Alternatively, does the Navy consider these requirements to be potential ARARs triggered by migration of contaminated groundwater from the shoreline area to Seaplane Lagoon?	**Response to Additional Comment 17.** Clarification has been added to the discussion indicating that the groundwater at IR Site 27 generally flows toward the surface water and that these requirements were identified for the potential discharge of groundwater to surface water. No point discharge to Seaplane Lagoon is being contemplated. Please see the response to Additional Comment 16.
Additional Comment 18. Table A2-3, page 1. In the discussion of State MCLs, several are identified in the "Comments" column as potentially relevant and appropriate, but the "ARAR Determination" column indicates that they are not an ARAR. This needs to be changed. EPA agrees that the State MCLs are relevant and appropriate for the inland groundwater.	**Response to Additional Comment 18.** Comment noted. The typographical errors have been corrected. The mismatched determinations have been revised. The more stringent MCLs have been identified as relevant and appropriate for the inland groundwater.
Additional Comment 19. Table A2-3, page 1. EPA does not consider the sections of the State Water Code to be ARARs, as they are authorizing provisions for the water boards and do not impose requirements that would be applicable or relevant and appropriate to the Navy's CERCLA action. If there are certain requirements established pursuant to these authorities that may be ARARs, e.g. water quality objectives, those requirements, and not the authorizing provisions, should be cited.	**Response to Additional Comment 19.** The EPA's statement on the State Water Code has been added to the discussion in Section A2.2.1.2 and is referenced in Table A2-3. The Navy has identified the Water Code sections in the table as enabling legislation only. The ARARs determination will be revised to indicate this position. The comments column has been revised to include a reference to the established requirements pursuant to the State Water Code in Table A2-3.
Additional Comment 20. Table A2-3, page 2, Basin Plan. Are beneficial uses other than MUN for groundwater considered to be potential ARARs for the shoreline groundwater?	**Response to Additional Comment 20.** Section A2.2.1.2 describes the groundwater beneficial uses for the site as MUN, AGR, IND and PROC. Other beneficial uses of shoreline groundwater are therefore considered in this FS Report.

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ADDITIONAL COMMENTS	RESPONSE TO ADDITIONAL COMMENTS
Additional Comment 21. Table A2-3, page 3, Resolution 92-49. Does the Navy consider section G to be an ARAR?	**Response to Additional Comment 21.** The Navy has identified Section G as a source of substantive requirements; however, Section G was determined not to be more stringent than federal ARARs and therefore is not considered a potential ARAR.
Additional Comment 22. Table A2-3, page 3, discussion of the Toxic Standards SIP. Do any of the remedial alternatives contemplate discharges into Seaplane Lagoon or San Francisco Bay?	**Response to Additional Comment 22.** Alternatives do not contemplate discharges to Seaplane Lagoon or San Francisco Bay. These standards are included in the ARARs analysis because shoreline groundwater may be migrating toward Seaplane Lagoon. See response to Additional Comment 17.
Additional Comment 23. Table A2-3, page 4, Resolution 92-49. It is not necessary to include this requirement twice.	**Response to Additional Comment 23.** The second entry of Resolution 92-49 has been deleted from Table A2-3 on page 4.
Additional Comment 24. Table A4-1, page 3, staging pile regulations. These regulations have been incorporated in California regulations at 22 CCR 66264.552(f).	**Response to Additional Comment 24.** Cal. Code Regs. tit. 22, § 66264.552(f) refers to the federal requirements at 40 C.F.R. § 264.554. Since it is not more stringent, Cal. Code Regs. tit. 22, § 66264.552(f) was not identified as a potential ARAR.
Additional Comment 25. Table A4-1, page 6. Discussion of the regulations on this page is confusing. Section 66264.90(c) seems to be an exception to or limit on 66264.117, so it seems strange that .117 is not included as an ARAR but .90(c) is.	**Response to Additional Comment 25.** Since no on-site source of the groundwater contamination has been identified at IR Site 27, the § 66264.117 requirement was determined not to be a potential ARAR. However, even though the § 66264.90(c) requirement references the § 66264.117 requirement, the substantive provision that requires 3 years of monitoring within compliance was determined to be relevant and appropriate for the alternatives that include proposed monitoring for natural attenuation.

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GENERAL COMMENTS	RESPONSE TO GENERAL COMMENTS
General Comment 1. The FSR addresses the risk pathway associated with the threat to groundwater only. The text of the FSR indicates the threat from the vapor intrusion pathway is negligible and does not need to be addressed. Based on the minimal depth of groundwater at this site, the ESU considers the vapor intrusion pathway to be a real threat to future site buildings under any residential land development scenarios. The ESU recommends a dedicated appendix or inclusion in existing appendices of more detailed information regarding the evaluation of the indoor vapor intrusion pathway as opposed to a singular sentence indicating there is no significant threat from this pathway.	**Response to General Comment 1.** Risk associated with the indoor air vapor intrusion pathway was evaluated in the RI Report as part of the baseline risk assessment. Because MCLs are identified as potential ARARs for inland groundwater, active treatment, MNA, and/or ICs will be implemented until VOC concentrations are reduced to a level at which MCLs are achieved. The Navy considers the use of MCLs as inland groundwater RAOs to be sufficiently protective for **all** exposure pathways at IR Site 27. For clarity, the following additional text from the final RI Report has been added to the third bullet in Section 2.6 (now the fourth bullet in Section 2.6.2) and replaces the last sentence in this bullet: "Based on human-health risk assessment (HHRA) results, inhalation of indoor air from this pathway represents a total cancer risk of 3×10^{-5} (U.S. EPA) or 4×10^{-6} (Cal/EPA), i.e., within the risk management range. U.S. EPA cancer risk based on modeling vapor migration to indoor air was calculated both by using concentrations of VOCs in groundwater and by using concentrations of VOCs in soil gas samples, and the results were compared and detailed in Appendix K of the RI Report (BEI 2005). The U. S. EPA residential indoor air cancer risks based on soil gas (3×10^{-5}) are slightly higher than those calculated using groundwater data (2×10^{-5}). Site-specific soil physical parameters collected as input for the Johnson and Ettinger model were found to be virtually the same as model default values. However, the model-calculated vapor permeability of 1.10×10^{-7} square centimeters (cm^2) is substantially more protective than the field-measured permeability of 3.3×10^{-9} cm^2. Because the indoor air concentration was higher (and therefore represents a greater risk) using the model default calculations, model default values were used rather than site-specific values."

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GENERAL COMMENTS	RESPONSE TO GENERAL COMMENTS
General Comment 2. The FSR indicates the monitored natural attenuation (MNA) treatment technology is an integral part of a number of treatment alternatives. The duration of the treatment alternatives containing the MNA option are based on the estimates of the success of multiple source area treatment technologies (i.e., ISB, ISCO, Dynamic Source Area Treatment). The duration of the MNA portion of the alternative following source area treatment is dependent on the concentration of COCs remaining after source treatment. In addition, the FSR has used a technology screening model, Biochlor, in combination with estimates of innovative and emerging treatment technology effectiveness to develop an overall alternative estimate of treatment duration and effectiveness, and cost. The ESU considers the use of a screening model such as Biochlor as a useful tool in the initial screening of treatment technologies. However, in order to support the type of analysis required in the detailed analysis of alternatives, the ESU recommends a more robust model such as Mod Flow in conjunction with additional site characterization information to provide an acceptable model.	**Response to General Comment 2.** IR Site 27 groundwater is currently being sampled and analyzed as part of the BGMP for MNA parameters as described in the response to U.S. EPA Specific Comment 29. A discussion of plume stability and MNA parameters has been added to Section 4.3.4.1. The revised text of Section 4.3.4.1, including two new figures (Figures 4-1 and 4-3) and one table (Table 4-4), is included herewith as Attachment 1*. Regarding use of the BIOCHLOR model, the Navy concurs that it is a screening tool. The Federal Remediation Technology Roundtable (FRTR) website described BIOCHLOR as a "natural attenuation screening model used to assess the feasibility of monitored natural attenuation (MNA) as a remedial approach for plumes of dissolved-phase chlorinated volatile organic compounds in groundwater" (FRTR 2004). MODFLOW add-ons also model natural attenuation, and would likely yield similar results to BIOCHLOR. There is, however, ample evidence in the data presented in the RI and BGMP reports that MNA is occurring. BIOCHLOR was used as the tool to estimate reaction rates in the MNA process for this FS Report. The Navy considers the BIOCHLOR model sufficient for FS purposes.

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GENERAL COMMENTS	RESPONSE TO GENERAL COMMENTS
General Comment 3. The ESU considers the proposal to use MNA as a requirement to obtain at a minimum the following site characterization information necessary to support the lines of evidence necessary for the choice of MNA as a viable treatment alternative. This information should be provided to the GSU for review prior to approval of a final FS. The following information can provide support to show the presence of the two lines of evidence necessary for the implementation of this remedy : a. The FSR indicates the plume is considered to be stable, the main line of evidence. The ESU recommends the FSR contain the information supporting this assumption in the FSR for GSU review. b. The FSR provides no physical data to support the presence of a conceptual model contributing to the success of MNA. A typical MNA alternative should contain physical data (i.e., Dissolved oxygen, MNA Parameters) that supports the presence of an anaerobic zone and sufficient electron donors (i.e., Nitrate, Sulfate). This data would provide the second necessary line of evidence.	**Response to General Comment 3.** Groundwater monitoring results for shoreline groundwater from 1995 to the present have shown stable and declining VOC concentrations. Groundwater monitoring results for inland groundwater from 2002 to the present also show stable and declining VOC concentrations. The presence of cis-1,2-DCE and vinyl chloride suggest that reductive dechlorination is occurring across the site. Data for IR Site 27 collected as part of the BGMP include MNA parameters. These data have been added to Section 4.3.4.1; the revised text of Section 4.3.4.1, along with two new figures and one table, is included herewith as Attachment 1*.

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GENERAL COMMENTS	RESPONSE TO GENERAL COMMENTS
General Comment 4. The ESU considers the inclusion of an MNA alternative as a requirement to address the need for an associated contingency plan. Every MNA alternative is required to contain a contingency plan. This is especially important at this site due to the uncertainties associated with the MNA alternatives. The MNA alternative is required to contain provisions for a sentinel well and a compliance well. The sentinel well, by way of monitoring results, will determine that the plume was not stable and indicate levels of contamination above target levels have reached this point. The compliance well can then be used to execute the contingency plan to contain the plume such that it can not migrate beyond this point and extracted groundwater can be adequately treated. The ESU does not see a cost for additional wells in the MNA alternatives cost analysis. Therefore , it must assume that the cost for well installation and subsequent analytical costs are not included in the detailed analysis of alternatives. The ESU considers the level of uncertainty regarding the effectiveness and duration of the present alternatives containing MNA as supportive of a treatment alternative that is not dependent on the implementation of MNA. Failure to resolve the above issues would appear to support the choice of Alternative 6B, sitewide ISCO treatment and groundwater confirmation sampling, as the recommended treatment alternative. The inclusion of the type of data discussed above or the execution of site specific treatability studies is recommended by ESU to provide the information necessary to support the treatment technologies recommended by the FSR	**Response to General Comment 4.** Uncertainties associated with MNA alternatives have been addressed in the response to General Comment 2 above. The Navy is not aware of a requirement for a contingency plan, nor is the Navy aware of a requirement for a sentinel well and a compliance well. The details of an MNA program (if an alternative is selected that involves MNA) would be developed during the remedial design stage. The assumed duration of MNA is based on conservative modeling assumptions; therefore, the actual time required to achieve MCLs is likely to be shorter. Additional MNA data are being collected as part of the BGMP. These additional data will be available for decision makers during the proposed plan stage.

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SPECIFIC COMMENTS	RESPONSE TO SPECIFIC COMMENTS
Specific Comment 1. The FSR indicates that vertical migration of contamination is prevented by the presence of a difference in density between underlying saltwater and contaminated groundwater. The ESU recommends the submission for review by GSU of relative information assessing the site wide presence of this layer to support this assumption.	**Response to Specific Comment 1.** The saline water interface depicted in Figure 2-16 of the draft FS Report is described in the beneficial use report (TtEMI 2000) and the final RI Report (BEI 2005). The Navy may install additional wells, as described in the response to U.S. EPA Specific Comment 37, if these are determined to be needed. These new wells could be used to better assess potential VOC migration to deeper groundwater and the thickness and depth of the saline water interface. The following additional information about the saline water interface has been added after the second sentence in the seventh paragraph in Section 2.5.3.3: "The presence of a saline layer underlying Alameda Point was documented by the presentation of TDS data collected from wells throughout Alameda Point included in the Determination of the Beneficial Uses of Groundwater study conducted in 2000 (TtEMI 2000b)."
Specific Comment 2. The ESU concurs with the use of the RACER cost estimating system and its application to this project. The ESU also concurs with the assumptions made and the discount rate used to evaluate the cost of alternatives.	**Response to Specific Comment 2.** Comment noted. No response required.

	Note: * the contents of this attachment have been incorporated into the draft final Feasibility Study Report, and are therefore not reproduced here **References:** Bechtel Environmental, Inc. 2005. Draft Final Remedial Investigation Report, IR Site 27, Dock Zone, Alameda Point, Alameda, California. July. BEI. *See* Bechtel Environmental, Inc. Federal Remediation Technology Roundtable. 2004. At www.frtr.gov/decisionsupport/DST_tools/BIOCLOR.htm. FRTR. *See* Federal Remediation Technology Roundtable. Tetra Tech EM Inc. 2000. Determination of the Beneficial Uses of Groundwater. Prepared for the United States Department of the Navy, Southwest Division Naval Facilities Engineering Command, San Diego, California. July 13. TtEMI. See Tetra Tech EM Inc.

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Comments from Michelle Dalrymple, DTSC-GSU, 1/20/2006

GENERAL COMMENTS AND RECOMMENDATIONS	RESPONSE TO GENERAL COMMENTS AND RECOMMENDATIONS
General Comment A. The alternatives presented in the Draft FS do not propose the installation of additional monitoring wells or sampling locations to monitor the effectiveness of the remedial alternatives or post-remediation contaminant migration. It is the opinion of GSU that additional monitoring locations are necessary. For example, there are currently no monitoring wells in the vicinity of boring 27B22 where the highest cis-I ,2-dichloroethylene (cis-1,2-DCE) concentrations were found in groundwater. A monitoring well is needed in this area to verify and monitor concentration trends in the vicinity of the cis-1,2-DCE plume center. In addition, it is the opinion of GSU that additional monitoring wells are needed directly downgradient from the VOC plume centers that originate at Building 168 and Ferry Point Road to provide groundwater monitoring data to evaluate the long-term effectiveness of the remedial alternatives. Recommendation GSU requests that the Navy evaluate the monitoring well network at IR Site 27 to determine where additional monitoring wells are necessary to monitor the selected remedy. GSU requests that a monitoring well is installed in the cis-1,2-DCE plume center west of Building 168, and that a transect of monitoring wells is installed downgradient from the plume centers originating at Building 168 and Ferry Point Road.	**Response to General Comment A.** The elevated cis-1,2-DCE concentration (230 µg/L) at boring 27B22 is not evidence of a separate cis-1,2-DCE plume. Rather, the Navy believes that it is evidence that reductive dechlorination of VOCs in this area has not yet progressed to vinyl chloride. When compared in molar terms, the highest mass of chlorinated VOCs in the Building 168 plume occurs in samples from boring 27B29. To better assess VOC distribution at IR Site 27, a new figure (Figure 2-16) depicting total mass of VOCs in micromoles per liter has been added to Section 2. Figure 2-16 is included herewith as Attachment 2*. The following paragraph has been added to Section 2.5.3.3 after the third paragraph: "Figure 2-16 shows the total mass of VOCs in micromoles per liter in groundwater at IR Site 27. The figure illustrates that molar concentrations of VOCs were highest in the vicinity of boring 27B29. Although the concentration of cis-1,2-DCE in µg/L at boring 27B22 was higher than at boring 27B29, the molar mass results indicate that reductive dechlorination in the vicinity of boring 27B22 has not yet progressed to vinyl chloride." Additional monitoring wells may be installed during the remedial design phase, if determined to be needed.

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GENERAL COMMENTS AND RECOMMENDATIONS	RESPONSE TO GENERAL COMMENTS AND RECOMMENDATIONS
General Comment B. The proposed alternatives target a 10-foot thick treatment zone. The 10-foot thick treatment zone targeted for remediation may be insufficient. The vertical profile for selected chlorinated VOCs in groundwater illustrated on Figure 2-16 shows the vertical extent of contamination at levels above 5 micrograms per liter (pg/L) extends to a depth greater than 10 feet below the water table. In addition, as noted in GSU's comments on the Draft Final RI Report for IR Site 27, sufficient data have not been obtained to delineate the vertical extent of VOCs in groundwater at IR Site 27 (see Specific Comment 7). **Recommendation** GSU requests that the Navy clarify the basis for the selected 10-foot interval targeted for remediation. Depth-discrete groundwater sampling from a deeper interval within the aquifer to verify the absence of groundwater contamination directly beneath the identified plume centers should also be included (see Specific Comment 7).	**Response to General Comment B.** The assumed 10-foot-thick treatment zone for Alternatives 4A, 6A and 6B is based on groundwater analytical results from monitoring wells and discrete sampling at depths of 10 and 20 feet bgs. The assumed 10-foot treatment zone extends from the top of the water table at 6 feet bgs to 16 feet bgs. Depth-discrete groundwater sampling results from 20 feet bgs indicated that VOC impacts do not extend beyond the depth of shallow groundwater. The assumed 10-foot treatment interval assumption would be reevaluated during the remedial design stage.
General Comment C. Four of the remedial alternatives retained for the detailed analysis include MNA as a component of the remedy. For each of these alternatives, BICHLOR was used to evaluate the MNA component. BIOCHLOR is a simplistic two dimensional screening tool and should not be used to determine the possible success of natural attenuation at IR Site 27. If MNA is to be considered a viable alternative, it must be demonstrated to be potentially successful with appropriate site-specific data and analyses. **Recommendation** Additional data collection and analyses should be performed pursuant to guidance specified in Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater (EPA/600/R-981-128) dated September 1998.	**Response to General Comment C.** The Navy has been conducting groundwater monitoring at IR Site 27 for over a decade. This monitoring, conducted under the BGMP, has included testing for MNA parameters since 2002. These MNA parameters include nitrate, nitrite, sulfate, sulfide, dissolved oxygen, oxidation-reduction potential, dissolved gases (e.g., ethane and ethene) and VOCs, consistent with the U.S. EPA technical protocol (U.S. EPA 1998). A discussion of MNA data has been added to Section 4.3.4.1, included herewith as Attachment 1*, and to Section 2.6, as described in the response to Specific Comment 8. The BIOCHLOR model was used to predict the end point of MNA for the purpose of comparing alternatives. Continued monitoring and data analysis under the BGMP will document the effectiveness of MNA.

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GENERAL COMMENTS AND RECOMMENDATIONS	RESPONSE TO GENERAL COMMENTS AND RECOMMENDATIONS
General Comment D. The comparative evaluation presented in Section 7 should be expanded to justify the relative scoring determinations of "high," "medium," and "low. " GSU was unable to fully agree with the relative scorings based on the limited discussions presented. **Recommendation** GSU requests further elaboration of the advantages and disadvantages and key trade-offs of each alternative so that the reviewer can fully understand the basis for the relative scoring with respect to each of the NCP criteria (see Specific Comments 11, 12, and 13).	**Response to General Comment D.** Alternative 2 has been screened out in Section 5, and, therefore, was not carried forward to Sections 6 and 7, as explained in the response to U.S. EPA General Comment 2. A more detailed comparative analysis of alternatives may be conducted during the proposed plan stage. Please refer to the responses to Specific Comments 11, 12 and 13.

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SPECIFIC COMMENTS	RESPONSE TO SPECIFIC COMMENTS
Specific Comment 1. Executive Summary. It is stated that the "chlorinated VOC plume" at IR Site 27 is depicted on Figure ES-3. However, Figure ES-3 shows only the vinyl chloride plume. The cis-1,2-DCE plume has a different configuration and is not represented on the figure. GSU suggests that a total VOC map is used to illustrate the lateral extent of chlorinated hydrocarbons in groundwater at IR Site 27, or that an overlay of the cis-1,2-DCE isoconcentration contours are added to Figure ES-3 (see Specific Comment 4).	**Response to Specific Comment 1.** Comment noted. A total VOC map (Figure 2-16) showing the mass of VOCs in micromoles per liter has been added, and is included herewith as Attachment 2*. Please refer to the response to General Comment A for further information regarding the presence of cis-1,2-DCE.
Specific Comment 2. Executive Summary. GSU requests that data gaps are discussed in the Executive Summary.	**Response to Specific Comment 2.** The following paragraph has been added to page ES-2 following the last paragraph under the Site Background heading: "Due to the expansion of the IR Site 27 boundaries to encompass the VOC plume, a washdown area (WD-166 and related oil/water separators) and Building 555 (an electrical substation) were included within the IR Site 27 boundaries. The RI Report identified data gaps associated with testing groundwater at the washdown area and with testing for PCBs in soil adjacent to Building 555. These data gaps are to be addressed during the remedial design phase."
Specific Comment 3. Section 2.5.3 - Analytical Results from Groundwater Samples. Several references to Alameda Point background concentrations for groundwater have been made in this section. However, it was decided in the Base Closure Team (BCT) meeting on October 18, 2005 that there are no Alameda Point background values established for groundwater. GSU requests that references to Alameda Point background concentrations for groundwater are removed from this section and elsewhere in the document.	**Response to Specific Comment 3.** The Navy acknowledges that the DTSC is conducting a review of the background data set; however, the Navy does not believe the conclusions of the RI Report should be affected by DTSC's review. At IR Site 27, arsenic is the only inorganic constituent that can be considered a risk driver in an exposure scenario based on domestic use of groundwater. Arsenic has been included as a COC in Table 3-1, with an RAO of 10 µg/L (based on the federal MCL). Please refer to the response to DTSC-OMF and HERD General Comment 2 for additional information regarding comparison to CTR criteria.

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SPECIFIC COMMENTS	RESPONSE TO SPECIFIC COMMENTS
Specific Comment 4. Section 2.5.3.3 - Chlorinated Volatile Organic Compound Plume. GSU questions why only the vinyl chloride isoconcentration contours are shown to represent the horizontal extent of the chlorinated VOC plumes. Cis-1,2-DCE was also found at elevated concentrations in the area west of Building 168 and in the vicinity of Ferry Point Road. GSU requests that an overlay of the cis-1,2- DCE isoconcentration contours are included on Figure 2-1 5, or that a total VOC map is used to provide a more complete representation of the contamination present in the shallow groundwater at IR Site 27.	**Response to Specific Comment 4.** A new figure (Figure 2-16) has been added to the FS Report, and is included herewith as Attachment 2*. This figure depicts the total mass of VOCs in micromoles per liter, as described in the responses to General Comment A and Specific Comment 1.
Specific Comment 5. Section 2.5.3.3 - Chlorinated Volatile Organic Compound Plume. GSU understands that chlorinated hydrocarbon concentrations exceeding approximately 1 percent of the aqueous solubility may indicate the presence of a dense non-aqueous phase liquid (DNAPL). However, standard industry practice does not use the absence of concentrations greater than 1 percent of the aqueous solubility as evidence that a DNAPL is not present at a site. DNAPL may still be present in an area or interval that is not represented by the sampling network. GSU requests that the argument for the absence of DNAPL based on aqueous concentrations below 1 percent of the solubility is removed from the Draft Final FS.	**Response to Specific Comment 5.** Comment noted. The presence of a DNAPL is rarely confirmed, except in the cases where the DNAPL is physically observed during remedial investigations or monitoring well sampling. Rather, evidence (e.g., soil gas concentrations, comparison of groundwater concentrations to effective solubilities of the original solvent mixture, and contaminant distribution) is considered and the potential for the presence of DNAPL is evaluated. At IR Site 27, the Navy's position is that DNAPL is unlikely to be present, based on groundwater and soil gas VOC concentrations, contaminant distribution, and the chemical properties of DNAPLs. For clarification, however, the last sentence in the third paragraph of Section 2.5.3.3 has been deleted.

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SPECIFIC COMMENTS	RESPONSE TO SPECIFIC COMMENTS
Specific Comment 6. Section 2.5.3.3 - Chlorinated Volatile Organic Compound Plume. The statement made regarding the reductions of VOC concentrations in shoreline wells in 2004 (see first sentence of second full paragraph on page 2-1 6) is unclear. Please clarify this statement and explain its significance.	**Response to Specific Comment 6.** The following text has replaced the first sentence in the fifth paragraph of Section 2.5.3.3: "VOC concentrations in shoreline wells have decreased significantly since 1994. Decreases in TCE and cis-1,2-DCE were accompanied by corresponding increases in vinyl chloride concentration. Based on the spring 2005 monitoring results, concentrations of vinyl chloride have now attenuated to nondetectable levels (ITSI 2005). These observations suggest that the natural attenuation process is at or near completion in the shoreline groundwater."
Specific Comment 7. Section 2.5.3.3 - Chlorinated Volatile Organic Compound Plume. GSU disagrees that the data obtained during the RI have demonstrated that the vertical extent of contamination above MCLs is 20 feet below ground surface (bgs). In the plume centers, no depth-discrete groundwater data was obtained below 10 feet bgs. In addition, lithologic data does not support the concept of limited vertical migration (i.e. there is no low permeability layer), and the freshwater/saline water interface argument is not supported with sufficient sites pecific data. Furthermore, at IR Site 9 located immediately southeast of IR Site 27, concentrations of VOCs were found to be relatively low at a depth of 10 to 15 feet bgs. However, concentrations were found to be an order-of-magnitude greater at 30 feet bgs. In fact, concentrations of VOCs at 45 feet bgs are still higher than those at 10 to 15 feet bgs, and are two orders-of-magnitude greater than the MCL. As stated in GSU's comments on the Draft Final RI Report, GSU requests that the vertical extent of VOCs in groundwater is considered a data gap at IR Site 27 and is verified during the remedial design phase. GSU requests that depth-discrete groundwater data are collected directly beneath the identified plume centers.	**Response to Specific Comment 7.** The plume center for the Building 168 plume is believed to be in the vicinity of boring 27B29, near the location of monitoring well 27MW06. Depth-discrete sampling of the deeper groundwater (to approximately 20 feet bgs) was conducted at several locations in the vicinity of that boring (upgradient, crossgradient, and downgradient). VOC results for deeper groundwater samples were below laboratory reporting limits or at least two orders of magnitude below the shallower results. Additional monitoring wells may be installed during the remedial design phase, if they are determined to be needed.

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SPECIFIC COMMENTS	RESPONSE TO SPECIFIC COMMENTS
Specific Comment 8. Section 2.6 - Fate and Transport of Contaminants. The following pertains to the fate and transport discussions: • **Please include additional discussion of the fate of chemicals of interest, primarily cis-1,2-DCE and vinyl chloride.** • **The discussion of fate and transport should include vertical transport as well as horizontal transport of chemicals of interest.** • GSU questions whether the railroad spurs are unpaved. If so, possible infiltration of precipitation along these lines could occur and locally affect groundwater flow and contaminant transport. **Please clarify whether this may be occurring at IR Site 27.**	**Response to Specific Comment 8.** Section 2.6 is a summary of Section 5 of the final RI Report (BEI 2005). The following additional text from the final RI Report has been added to Section 2.6 (as 2.6.1) following the second paragraph and creating a 2.6.2 subheading before the third paragraph: **"2.6.1 Fate of Organic Compounds** "The persistence or mobility of organic compounds is governed by their physicochemical properties, transformation mechanisms and the properties of the soil that act on them. "Chlorinated VOCs (cis-1,2-DCE; trans-1,2-DCE; TCE; and vinyl chloride) are the primary chemical group impacting groundwater at IR Site 27; chlorinated VOCs are simple organic compounds bonded with chlorine. In the subsurface, depending on conditions (the presence of nutrients, microorganisms, a reducing environment, etc.), chlorinated VOCs typically undergo reductive dechlorination, a biological process that breaks down chlorinated ethenes in groundwater. "The chlorinated ethenes PCE and TCE degrade in reducing environments to form 1,2-DCE or 1,1-DCE (the most common intermediate is cis-1,2-DCE), and vinyl chloride. The presence of vinyl chloride, cis-1,2-DCE and trans-1,2-DCE in groundwater at IR Site 27 indicates that reductive dechlorination of PCE and TCE is occurring. Continued dechlorination of 1,2-DCE may initially cause vinyl chloride concentrations in groundwater to increase over time. However, vinyl chloride can be rapidly degraded (oxidized) under aerobic (in the presence of oxygen) conditions to ethene, carbon dioxide, water, and chlorine, with ethene further degraded to ethane (U.S. EPA 1998). Additionally, in an anaerobic (in the absence of oxygen) environment, microorganisms known as dehalococcoides and several similar organisms can completely dechlorinate TCE, DCE, and vinyl chloride (Major 2002). At least one

Comments from Michelle Dalrymple, DTSC-GSU, 1/20/2006

SPECIFIC COMMENTS	RESPONSE TO SPECIFIC COMMENTS
Specific Comment 8 (continued).	**Response to Specific Comment 8 (continued).** strain of these microorganisms is present at Alameda Point (Koenigsberg et al. 2002, 2003; Richardson et al. 2002). "Monitoring of dissolved gases under the basewide groundwater monitoring program confirms the presence of ethene and ethane, which are products of the dechlorination of vinyl chloride in groundwater at IR Site 27; this indicates that the breakdown of vinyl chloride is occurring. **"2.6.2 Transport Mechanisms** "A summary of the possible...[existing text follows]." The following bullet has been inserted after the first bullet in newly numbered Section 2.6.2: • "Vertical transport of chlorinated VOCs is not considered a significant transport mechanism, based on VOC data and the approximate location of the saline interface." To address the question of railroad spurs as a potential infiltration pathway, the following text has been added to the penultimate bullet in Section 2.6.2: "Most of IR Site 27 is paved, including the locations of railroad spurs."
Specific Comment 9. Section 4.3.4.1 – Lines of Evidence. It is stated on page 4-7, at the end of the first paragraph that the model simulation results indicate that natural attenuation is occurring. However, the model is designed to simulate decay. The model cannot be used to indicate whether natural attenuation is occurring because the decay rate is a user-defined term. **Please correct this statement**.	**Response to Specific Comment 9.** Comment noted. The last sentence under the Modeling heading in Section 4.3.4.1 has been revised to state the following: "The model simulation results presented in Appendix B are used in this FS Report to predict the rates of decay and the duration for MNA that are required to reach RAOs." Please see Attachment 1* for the new text of Section 4.3.4.1.

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SPECIFIC COMMENTS	RESPONSE TO SPECIFIC COMMENTS
Specific Comment 10. Section 5.1.8 – Alternative 6B – Sitewide ISCO Treatment and Groundwater Confirmation Sampling. One year of post-remediation monitoring may not be sufficient to monitor the success of this alternative. Average linear groundwater flow velocities published in the Draft Final RI Report are on the order of 0.005 to 0.075 feet per day at IR Site 27. **GSU requests that the duration of post-remediation monitoring is supported with additional evaluation using site- and chemical-specific information. This evaluation should include the possible diffusion of postremediation contaminants from soils in the plume cores, and the length of time that would be expected for those contaminants to reach downgradient monitoring locations**	**Response to Specific Comment 10.** For FS purposes, one additional groundwater monitoring event has been added to Alternative 6B at the end of year 3, as described in the response to U.S. EPA Specific Comment 41. The post-remedial monitoring program will be developed during the remedial design phase. Additional monitoring wells may be installed if determined to be needed.
Specific Comment 11. Section 7.3 – Long-Term Effectiveness and Permanence. It is stated that Alternatives 2 and 3 received a ranking of "medium" because the assumed 70-year duration would require implementation of institutional controls (ICs) for a longer time-period than durations assumed for 4A, 6A, and 7. The assumed duration is also much longer than that assumed for Alternative 6B. **Please add Alternative 6B to this statement.**	**Response to Specific Comment 11.** Alternative 2 has been eliminated from further consideration in Section 5 on the basis of low effectiveness, because no means would be provided to assess whether RAOs were achieved. The following sentence has been inserted after the first sentence in the second paragraph in Section 7.3: "The assumed duration for Alternative 3 is also considerably longer than that assumed for Alternative 6B."
Specific Comment 12. Section 7.3 – Long-Term Effectiveness and Permanence. It is unclear why Alternatives 4A, 6A, and 6B all received "high" rankings for long-term effectiveness and permanence when the assumed 60-year and 45-year durations for Alternatives 4A and 6A, respectively, would require implementation of ICs for a longer time-period than the duration assumed for Alternative 6B (2 years). **Please clarify.**	**Response to Specific Comment 12.** Alternatives 4A, 6A and 6B each involve varying degrees of *in situ* groundwater treatment to reduce VOC concentrations in groundwater. These treatments are assumed to reduce VOC concentrations in a short period of time. While Alternatives 4A and 6A are assumed to require ICs and MNA to reach RAOs, the effectiveness of the treatment is assumed to be permanent and effective.

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SPECIFIC COMMENTS	RESPONSE TO SPECIFIC COMMENTS
Specific Comment 13. Section 7.5 – Short-Term Effectiveness. GSU questions why Alternatives 2 (ICs) and 3 (MNA) received a "high" score for short-term effectiveness while Alternative 4A, 6A, and 6B received a "medium" score. One criterion that is evaluated as part of short-tem effectiveness is the time until RAOs are achieved. Alternative 6B is expected to require only two years to achieve RAOs, and the other alternatives are expected to require between 45 and 70 years. **GSU requests clarification regarding the criteria used and relative scores applied to the various alternatives with respect to short-term effectiveness.**	**Response to Specific Comment 13.** Alternative 2 has been screened out in Section 5, and, therefore, is not discussed in Sections 6 and 7 of the draft final FS Report, as described in the response to U.S. EPA General Comment 2. The ranking of alternatives in accordance with the short-term effectiveness criterion is also described in the responses to U.S. EPA General Comment 3 and U.S. EPA Specific Comment 30.

	Note: * the contents of this attachment have been incorporated into the draft final Feasibility Study Report, and are therefore not reproduced here **References:** Bechtel Environmental, Inc. 2005. Draft Final Remedial Investigation Report, IR Site 27, Dock Zone, Alameda Point, Alameda, California. July. BEI. *See* Bechtel Environmental, Inc. Innovative Technical Solutions, Inc. 2005. Spring 2005 Alameda Basewide Groundwater Monitoring Report. Alameda Point, Alameda, California. July. ITSI. *See* Innovative Technical Solutions, Inc. Koenigsberg, S.S., C.A. Sandefur, and K.A. Lapus, and G. Pasrich. 2002. Facilitated desorption and incomplete dechlorination: Observations from 350 applications of HRC (poster presentation). *Proceedings,* Third International Conference on Remediation of Chlorinated and Recalcitrant Compounds. Monterey, California. May 20–23. Koenigsberg, S.S., J.C. Bensch, and C.E. Lombardi. 2003. Implications for Bioaugmentation at a RABITT Protocol Site Revisited. *Proceedings,* Seventh International In Situ and On-Site Bioremediation Symposium, Orlando, Florida. June 2–5. Major, D. 2002. To Bioaugment or Not to Bioaugment, That is the Question. GeoSyntec Consultants. Richardson, R.E., V.K. Bhupathiraju, D.L. Song, T.A. Goulet, and L. Alvarez-Cohen. 2002. Phylogenetic characterization of microbial communities that reductively dechlorinate TCE based upon a combination of molecular techniques. *Environmental Science & Technology. 36*: 2652–2662. U.S. EPA. 1998. Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater. EPA/600/R-981-128. September.

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Comments from Marcia Liao, DTSC-OMF and HERD, 1/23/2006

GENERAL COMMENTS	RESPONSE TO GENERAL COMMENTS
General Comment 1. Arsenic in some inland well samples exceeds the U.S. EPA drinking water Maximum Contaminant Level (MCL) of 10 pg/L, but not the California Department of Health Services (DHS) drinking water MCL of 50 pg/L (Section 2.5.3, page 2-14). However, the California DHS drinking water MCL for arsenic is under review. As part of that process, the California EPA (CalEPA) Office of Environmental Health Hazard Assessment (OEHHA) has developed a Public Health Goal (PHG) for arsenic in water of 0.004 pg/L (CalEPA, 2004) (http://www.oehha.ca.gov/water/phg/pdf/asfinal.pdf). The following summary from the OEHHA document outlines the relationship of the PHG to the California MCL being developed: The U. S. EPA 's final rule on arsenic in drinking water (U. S. EPA, 2001) developed an MCLG of zero. The MCLG is the functional equivalent of the California public health goal (PHG) for drinking water. The U.S. EPA also established a national primary drinking water regulation or MCL for arsenic of 10 ppb. U. S. EPA's upper bound (90th percentile) estimates of lifetime cancer risk at 10 ppb ranged up to 6.1 in 10,000. This federal regulation does not become fully effective until 2006. In California the MCL for arsenic will be determined by the Department of Health Services to be as close to the PHG as possible considering other factors such as cost and analytical feasibility. All of these assessments recognize the relatively high cancer risks associated with chronic exposure to inorganic arsenic. The current assessment refines and extends our earlier arsenic risk assessment (OEHHA, 1992a). OEHHA has developed a public health goal (PHG) of 0.004 pg/L (4 ppt) for arsenic in drinking water based on the mortality of arsenic-induced lung and urinary bladder cancers observed in epidemiological studies of populations in Taiwan, Chile, and Argentina	**Response to General Comment 1.** Comment noted. Arsenic concentrations (maximum 23.9 µg/L) in samples from one inland monitoring well (well 15-MW3) exceed the MCL of 10 µg/L. Arsenic has been added as a COC for inland groundwater in Table 3-1 with an RAO of 10 µg/L. Arsenic concentrations in shoreline groundwater do not exceed surface water comparison criteria, so arsenic is not considered a COC in the shoreline portion of IR Site 27.

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ALAMEDA POINT, ALAMEDA, CALIFORNIA
DATED OCTOBER 2005
CTO-0069/0446

Comments from Marcia Liao, DTSC-OMF and HERD, 1/23/2006

GENERAL COMMENTS	RESPONSE TO GENERAL COMMENTS
General Comment 1 (continued). Given the equivalence of the U.S. EPA MCLG to the OEHHA PHG and the current revision process of the California DHS MCL for arsenic, the protective action is to consider the U.S. EPA MCL of 10 µg/L as the appropriate Remedial Action Goal (RAO) rather than the current California DHS MCL of 50 pg/L.	**Response to General Comment 1 (continued).**
General Comment 2. Groundwater concentrations of copper, lead, mercury, nickel and zinc were identified as exceeding the California Toxics Rule (CTR) criteria, but discounted as comparable to NASA (Alameda Point) 'background concentrations' (Section 2.5.3, page 2-14). As a point of historical accuracy, HERD never reviewed nor agreed to any groundwater 'ambient' concentrations for inorganic elements. HERD only recently received, as part of a Resource Conservation and Recovery Act (RCRA) facility review, an electronic copy of the proposed groundwater ambient data set. Preliminary analysis of this data set indicates that lead and nickel have obvious high outliers which must be removed from any ambient data set. The mercury data set, with 198 total samples, contains only 2 detected concentrations, meaning that nearly 99 percent of the values represent laboratory detection limits rather than mercury concentrations in the environment. Ambient groundwater concentrations should not be used as a screening criterion for IR Site 27 pending completion of HERD review and resolution with the Navy.	**Response to General Comment 2.** The Navy acknowledges that DTSC is conducting a review of the groundwater background data set. The Navy does not anticipate that this review will result in any changes in which chemicals were carried forward from the RI Report to the FS Report. A review of data for metals with CTR criteria that were found to be distributed statistically equivalent to the background data set (i.e., copper, lead , mercury, nickel, and zinc) shows that the number of samples with concentrations exceeding the CTR chronic toxicity criteria is limited (regardless of the background comparison). The table below presents the total number of groundwater samples and the limited number of samples with metals concentrations exceeding CTR criteria.

Analyte	Samples Analyzed	Number Exceeding CTR CCC Criterion
Copper	83	11
Lead	83	3
Mercury	78	5
Nickel	83	12
Zinc	83	1

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General Comment 3. The ambient groundwater data set should not be used for comparison of the groundwater concentration in shoreline wells (Section 2.5.3.1, pages 2-14 and 2-1 5) to groundwater ambient concentrations until HERD'S review of the groundwater ambient data set is completed. For example, preliminary analysis indicates that beryllium data set consists of 18 detected and estimated (J-qualified) concentrations, with a non-parametric distribution, out of 194 'values' and the selenium groundwater ambient data set contains a single estimated (J-qualified) value out of 193 'values'. For these reasons, and those cited in the preceding specific comment, comparisons to NASA 'background concentrations' should not be considered for most inorganic elements.	**Response to General Comment 3.** For the two metals cited in this comment, beryllium and selenium, concentrations reported in groundwater are less than the CTR criteria; therefore, comparison to background criteria was not necessary. Please see response to General Comment 2 for a discussion of metals with concentrations exceeding CTR criteria.
General Comment 4. The source of the release of Volatile Organic Compounds (VOCs) to IR Site 27 groundwater is unknown. The current conception is that the source could be either the historical activities in Building 168 or, less likely, migration of a slug of VOCs in groundwater from a release upgradient of IR Site 27 (Section 2.5.3.3, page 2-1 5). The Navy has deferred sampling and analysis in the vicinity of washdown area (Section 2.8, page 2-22) which might resolve the uncertainty regarding the source of VOCs. Remediation without clear and accepted designation of the release site would seem unwise.	**Response to General Comment 4.** There were no indications that the washdown area, which is located outside and crossgradient to the VOC plume, could be a source of the VOC plume. The Navy identified the washdown area as a data gap in the general characterization of the area encompassed by the expanded IR Site 27 boundaries, rather than as a data gap associated with characterization of the VOC plume (BEI 2005). Reference: Bechtel Environmental, Inc. 2005. Draft Final Remedial Investigation Report, IR Site 27, Dock Zone, Alameda Point, Alameda, California. July. BEI. *See* Bechtel Environmental, Inc.

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General Comment 5. While unlikely to be risk drivers, the distribution of inorganic elements removed from the health assessment based on NASA 'background' concentrations should be evaluated in a well-by-well manner similar to that provided for arsenic.	**Response to General Comment 5.** Table 2-6 presents the human-health risk assessment calculation of total risk. No inorganic elements were removed from these calculations included in the RI Report. As stated in the RI Report, every chemical detected at least once was included in the risk assessment. With the exception of arsenic, the contribution of inorganic elements to the total risk is negligible (a total risk of less than 10^{-6} combined). Specifically, the total risk for ingestion of groundwater is 5×10^{-4}, of which arsenic represents 3×10^{-4} and vinyl chloride represents 2×10^{-4}. Because no other inorganic element is a risk driver and no other inorganic element was reported at a concentration exceeding an MCL, no well-by-well evaluation is necessary for other inorganic elements.
General Comment 6. The remedial action objectives (RAOs) apply at appropriate shoreline monitoring wells, not in the receiving water following initial dilution (Section 3.4, page 3-7). Please consult San Francisco Bay Regional Water Quality Control Board (RWQCB) for further direction on this issue.	**Response to General Comment 6.** CTR criteria are surface water ARARs; they apply to the surface water rather than to the monitoring wells. It has been determined that the shoreline groundwater at monitoring wells already meets the CTR criteria before entering the surface water. Although the Navy's position is that a mixing zone at the point of discharge to the surface water is appropriate for this scenario, a mixing zone is not necessary to demonstrate compliance with RAOs in shoreline groundwater. Please refer to the response to RWQCB Specific Comment 7.

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Comments from Judy Huang, RWQCB, 1/23/2006

GENERAL COMMENTS	RESPONSE TO GENERAL COMMENTS
General Comment 1. **Definition of Inland vs. Shoreline Groundwater:** It is unclear to staff exactly how the report proposed to delineate shoreline vs. inland groundwater. Please clarify.	**Response to General Comment 1.** For FS purposes, the delineation between shoreline groundwater and inland groundwater is the sheet pile bulkhead, as discussed in Section 2.4.6 of the draft Feasibility Study (FS) Report. The approximate location of the bulkhead is shown on Figure 2-1.

SPECIFIC COMMENTS	RESPONSE TO SPECIFIC COMMENTS
Specific Comment 1. **Page ES-3, Remedial Action Objectives, First Paragraph, Second Sentence:** This sentence stated, "RAOs for shoreline groundwater are based on California Toxics Rule criteria for human health (consumption of organisms)." First, in addition to the California Toxics Rule (CTR) criteria for human health, CTR salt-water criteria for the protection of aquatic life should also be applied. Second, due to the potential for inland groundwater to be discharged to Seaplane Lagoon through preferential pathways such as storm sewer gravel bedding, CTR criteria should also be applied to inland groundwater. Please revise the Draft FS.	**Response to Specific Comment 1.** The site-specific screening-level ecological risk assessment (ERA) for IR Site 27 conducted as part of the RI (BEI 2005) concluded that VOCs and metals in shoreline groundwater do not pose a risk to aquatic receptors, and that, therefore, no protective measures are warranted and no RAOs are necessary. Additional text has been added to Section 2.7.2 providing the basis for this conclusion; text has also been added to the Executive Summary on pages ES-2 and ES-3. Section 2.7.2 has been revised to clarify the low-to-negligible risk to aquatic life organisms in surface water adjacent to IR Site 27 and to indicate that there would be no need for aquatic life RAOs for surface water adjacent to IR Site 27. The following paragraphs have been inserted at the beginning of Section 2.7.2: "Chemicals of potential ecological concern (COPECs) for aquatic receptors at San Francisco Bay were identified using analytical data collected from groundwater monitoring wells, and included all chemicals that were reported at least once. As a conservative measure, concentrations of COPECs for aquatic receptors were estimated using

Comments from Judy Huang, RWQCB, 1/23/2006

SPECIFIC COMMENTS	RESPONSE TO SPECIFIC COMMENTS
Specific Comment 1 (continued).	**Response to Specific Comment 1 (continued).** maximum concentrations of COPECs in groundwater; these maximum concentrations were compared to California Toxics Rule (CTR) criteria continuing concentrations (CCCs). Therefore, the ERA provides a protective overestimate of the actual risk of adverse ecological effects at IR Site 27. "Based on sitewide groundwater concentrations, there is low-to-negligible potential ecological risk from reported COPECs for aquatic receptors, even if groundwater were to enter Seaplane Lagoon at the maximum reported concentrations. The ERA identified a potential for VOCs to exceed the CTR screening values for human-health consumption of organisms if aquatic life organisms were to consume chemicals in groundwater that reaches Seaplane Lagoon. The VOCs at IR Site 27 likely represent a low potential ecological risk due to low HQs, infrequent occurrence, concentrations below CTR criteria for human-health consumption of organisms in shoreline wells, and nonpersistence in aquatic environments. Therefore, the ERA concluded that, due to the low or negligible risk for aquatic life from reported COPECs, no further investigation or assessment of ecological risk for groundwater reaching surface water at IR Site 27 is recommended." Executive Summary, page ES-2, Site Background. The following sentence has been added to the end of the penultimate paragraph: "The ERA provides a protective overestimate of the actual risk of adverse ecological effects to aquatic life organisms in surface water adjacent to IR Site 27 because of the conservative nature of the assumptions used, i.e., maximum concentrations of chemicals in groundwater were compared to California Toxics Rule criteria continuing concentrations (CCCs)."

SPECIFIC COMMENTS	RESPONSE TO SPECIFIC COMMENTS
Specific Comment 1 (continued).	**Response to Specific Comment 1 (continued).** Executive Summary, page ES-3, Remedial Action Objectives. The following sentence has been added to the end of the third paragraph. "No surface water RAOs for aquatic receptors are selected for IR Site 27 because of the lack of significant ecological risk to aquatic life organisms, as established by the ERA conducted at IR Site 27." As described in Section 1.3.4.5 of the RI Report (BEI 2005), previous investigations concluded that storm drain bedding materials at Alameda Point are not a preferred pathway for migration of contaminants (TtEMI 2002). Therefore, the discharge of inland groundwater through storm sewer bedding was not identified as a significant pathway in the RI Report. The Navy does not consider surface water CTR criteria to apply to inland groundwater. Section 3.4 has been revised to state that the RAOs selected for inland groundwater were the lowest of the federal MCL, the nonzero federal MCLG, or the state MCL. The last bullet in Section 3.4 has been deleted. For COPECs in shoreline groundwater that may discharge to Seaplane Lagoon, surface water CTR criteria for human-health consumption of organisms were used as RAOs. Because shoreline groundwater already meets these RAOs, accounting for a mixing zone or attenuation factors was not considered necessary.

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SPECIFIC COMMENTS	RESPONSE TO SPECIFIC COMMENTS
Specific Comment 2. **Page 3-2, Section 3.2 Potential Receptors and Exposure Pathways, Second Paragraph:** This paragraph stated that "ICs could be used to prevent installation of drinking water wells within the area of the IR site 27 groundwater plume to prohibit extraction of VOC impacted groundwater for domestic purposes until after remediation goals are achieved or the Navy and regulatory agencies agree that ICs are no longer required." In addition to preventing installation of drinking water wells to preclude human exposure to the contaminated groundwater, it should also be stated that the ICs minimize the potential migration of the contaminated groundwater to the deep aquifer. Please revise the Draft FS to reflect this fact.	**Response to Specific Comment 2.** The last sentence in the third paragraph in Section 3.2 has been revised to read as follows: "ICs could be used to prohibit installation of drinking water wells within the area of the IR Site 27 groundwater plume, extraction of VOC impacted groundwater for domestic purposes, and cross-connection between FWBZ and SWBZ groundwater until after remediation goals are achieved or the Navy and regulatory agencies agree that ICs are no longer required." The specific elements of the IC program would be developed during the remedial design stage.
Specific Comment 3. **Page 3-2, Section 3.2 Potential Receptors and Exposure Pathways, Last Paragraph:** This paragraph stated that "Potential ecological impacts of discharges to Seaplane Lagoon would be mitigated by VOC dilution and volatilization that would occur as groundwater seeps into and mixes with the surface water." The Basin Plan does not grant dilution credit for discharges such as those at Site 27 into Seaplane Lagoon without a site-specific technical demonstration. However, the Basin Plan would allow attenuation of groundwater in soil prior to the point of discharge. Please remove the dilution discussion or replace it with a discussion of attenuation factor.	**Response to Specific Comment 3.** The last three sentences in the penultimate paragraph in Section 3.2 of the draft FS Report have been deleted.

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Specific Comment 4. **Page 3-3, Section 3.2 Potential Receptors and Exposure Pathways, First Paragraph:** This paragraph stated "the nature of the potentially impacted surface water ecosystem could be significantly changed by local redevelopment in the coming years. Therefore, it would be highly speculative to predict any future adverse ecological effects based on current conditions." Staff disagrees with this statement. This statement directly contradicts the purpose of a CERCLA cleanup action. CERCLA specifically requires the responsible party to cleanup the site to protect future reuse, including ecological effects. Please revise the Draft FS.	**Response to Specific Comment 4.** The last two sentences of Section 3.2 have been deleted.
Specific Comment 5. **Page 3-5, Section 3.3.1.1 Groundwater Second Full Paragraph:** This paragraph stated that shoreline groundwater does not have to meet MCLs, but inland groundwater does. However, it is unclear to staff how shoreline and inland groundwater is defined. Please clarify.	**Response to Specific Comment 5.** Please refer to the response to General Comment 1.
Specific Comment 6. **Page 3-7, Section 3.4 Remedial Action Objectives for IR Site 27 Groundwater, Third Paragraph, Fourth Bullet:** This bullet stated the CTR criterion for protection of human health based on consumption of saltwater aquatic life (risk-based) is a Remedial Action Objective (RAO) for IR Site 27. CTR criterion for the protection of aquatic life should also be included as a Remedial Action Objective. Please revise the Draft FS.	**Response to Specific Comment 6.** Please refer to the response to Specific Comment 1.

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SPECIFIC COMMENTS	RESPONSE TO SPECIFIC COMMENTS
Specific Comment 7. **Page 3-7, Section 3.4 Remedial Action Objectives for IR Site 27 Groundwater, Last Paragraph:** This paragraph stated that "RAOs derived from numerical water quality criteria for priority pollutants promulgated in the CTR (40CFR §131.38) and implemented in the Enclosed Bays and Estuaries Plan (SWRCB 2000) as part of the Basin Plan apply in the receiving water (Seaplane Lagoon and San Francisco Bay), following initial dilution. A mixing zone above the physically identifiable point of discharge in the receiving water is assumed for the purposes of this FS Report." Section 1.4.2, of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP) does allow the Water Board to grant dilution credits based on mixing zones. However, the SIP further states that "Dilution credits and mixing zones for incompletely-mixed discharges shall be considered by the RWQCB only after the discharger has completed an independent mixing zone study and demonstrated to the satisfaction of the RWQCB that a dilution credit is appropriate." In the absence of a Water Board approved mixing zone study, it is inappropriate for the Draft FS to assume a mixing zone exists. Please revise the Draft FS.	**Response to Specific Comment 7.** Typically, the discharge from groundwater to surface water is slow and allows for complete mixing. The concentrations of COCs (VOCs and arsenic) in groundwater, however, are already below the surface water ARARs (CTR criteria for human-health consumption of organisms). Although the Navy believes that the mixing zone is in compliance with substantive ARARs, the text will be deleted to remove the mixing zone assumption phrase because no attenuation factor is necessary in order to meet the CTR criteria for this site.
Specific Comment 8. **Page A2-1, Appendix A, Section A2.1.1.1 Groundwater ARARs Conclusions:** The proposed ARAR list is incomplete. The attached table has additional ARARs that should be included in the Draft FS. Please include the ARARs in the attached table and revise the relevant discussions in the Draft FS.	**Response to Specific Comment 8.** Comment noted. The potential ARARs listed in the table were included in the ARARs analysis in Appendix A. The table attached to the RWQCB comments has been expanded (as Table 1) to include a response column to address each of the listed requirements. Please see Table 1 for Navy responses to this list of potential ARARs.

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Specific Comment 9. **Page A2-3, Potential Federal ARARs:** 40 CFR Part 131, *Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California*, promulgated by US EPA on May 18, 2000 (California Toxic Rule) is a Federal ARAR for Site 27. Please revise the Draft FS to include the CTR.	**Response to Specific Comment 9.** Table A2-2 includes 40 C.F.R. 131.38 as a potential surface water ARAR. The text of Table A2-2 has been revised to include a note indicating that the listed water quality standards are stated in the CTR. Reference to the CTR is also included in Sections A2.1.2 and A2.2.2.1 (both pertaining to surface water) in Appendix A of the FS Report.
Specific Comment 10. **Page A2-10, Comprehensive Water Quality Control Plan for San Francisco Bay Basin (Basin Plan):** This section stated that since Basin Plan allows for exceptions for MUN designation and that the shoreline groundwater beneath IR Site 27 meets the exemption criteria, the shoreline groundwater should not be considered as a drinking water source (page 2-5 of the Basin Plan). Staff disagrees with this assessment. In addition to allowing for MUN designation exceptions, page 2-6 of the Basin Plan further states that "in making any exceptions, the Regional Board will consider the criteria referenced in Regional Board Resolution No. 89-63, "Sources of Drinking Water." Section 4 of Resolution 89-63 titled Regional Board Authority to Amend Use Designation states "any body of water which has a current specific designation previously assigned to it by a Regional Board in Water Quality Control Plans may retain that designation at the Regional Board's discretion." Because Site 27 falls within a groundwater basin classified by the *East Bay Plain Groundwater Basin Beneficial Use Evaluation Report – Alameda and Contra Costa Counties, California,* (California Regional Water Quality Control Board, San Francisco Bay Region, June 1999) as a significant drinking water source, the shallow aquifer should be cleansed to Department of Health Services' maximum contaminant levels for drinking water. This is because the deeper aquifers underlying the shallow aquifer zone are of drinking water quality. The issue of contamination of the deeper aquifer via vertical conduits from the shallow zone and the fact that an approved well abandonment program has never been instituted requires this approach.	**Response to Specific Comment 10.** The substantive requirements of the Basin Plan that have been determined to be ARARs include the criteria that must be met for groundwater to be considered a potential source of drinking water. The site-specific technical analysis using the "Sources of Drinking Water" criteria set forth in SWRCB Res. 88-63 is provided in Section 2.4.6 and Section A2.2.1.1 of the FS Report. The shoreline groundwater does not meet these substantive criteria for consideration as a potential source of drinking water. The Regional Board's "discretion" regarding whether or not to grant an exception is not a substantive requirement, and therefore this element of the Basin Plan is not an ARAR. The RI data for groundwater samples beneath the known contamination at the site show no indication that VOCs from the shallow groundwater are migrating vertically.

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Table 1 (for Response to RWQCB Specific Comment 8)
ARARs for Groundwater Remediation

#	Source	Standard, Requirement, Criterion, or Limitation	Description	ARARs, or To Be Considered	RWQCB Comments	Navy Response
1	Porter-Cologne Water Quality Control Act (California Water Code Section 13000 et seq.)	California Water Code Section 13243	The RWQCB may specify certain conditions or areas where the discharge of waste, or certain types of waste, will not be permitted.	Applicable	Applies to groundwater remedial action	Cal. Water Code §13243 is already included in Table A2-3 and Sections A2.1.1, A2.1.2, and A2.2.1.2 as enabling legislation, implemented through the beneficial uses, water quality objectives, waste discharge requirements, and promulgated policies of the Basin Plan.
2	Porter-Cologne Water Quality Control Act (California Water Code Sections 13240, 13241, 13242, 13243)	Water Quality Control Plan (Basin Plan) for the San Francisco Bay Basin, RWQCB, SFB	Establishes water quality objectives, including narrative and numerical standards, that protect the beneficial uses and water quality objectives of surface and ground waters in the region. Describes implementation plans and other control measures designed to ensure compliance with statewide plans and policies and provide comprehensive water quality planning. Alameda Point lies within the East Bay Plains Groundwater Basin. Existing and potential beneficial uses of this groundwater are: municipal and domestic supply, industrial process water supply, industrial service water supply, agricultural water supply, and freshwater replenishment to surface water.	Applicable	Specific applicable portions of the Basin Plan include beneficial uses of affected water bodies and water quality objectives to protect those uses. Any activity, including, but not limited to, the discharge of contaminated soils or waters or in-situ treatment or containment of contaminated soils or waters, must not result in actual water quality exceeding water quality objectives.	The Basin Plan has already been identified as a potentially applicable ARAR in Table A2-3, and Sections A2.1.1, A2.1.2, and A2.2.1.2.

Table 1 (continued)

#	Source	Standard, Requirement, Criterion, or Limitation	Description	ARARs, or To Be Considered	RWQCB Comments	Navy Response
3	Porter-Cologne Water Quality Control Act (California Water Code Sections 13000, 13304, 13240, 13241, 13242, 13243)	RWQCB, SFB Basin Plan, "Implementation Plan, Groundwater Protection and Management, Cleanup of Polluted Sites."	Establishes and describes policy for investigation and remediation of contaminated sites. Also includes implementation actions for setting groundwater and soil cleanup standard.	Applicable	Cleanup standards for water should be equal to background concentrations unless such levels are technically and economically infeasible to achieve. In such cases, cleanup standards should not exceed applicable water quality objectives.	The Navy has determined that Cal. Code Regs. tit. 22, § 66264.94(a)(1) and (3), (c), (d) and (e) are potentially relevant and appropriate federal ARARs which have the same requirement for concentration limits to be set at background unless technologically or economically infeasible. Since the Basin Plan "Implementation Plan" is not more stringent, it is not a potential ARAR.
4	Porter-Cologne Water Quality Control Act (California Water Code Sections 13240, 13241, 13242, 13243)	RWQCB, SFB Basin Plan, "Water Quality Objectives"	This policy defines water quality objectives and explains how the Regional Water Board applies numerical and narrative water quality objectives to ensure the reasonable protection of beneficial uses of water and how the Regional Water Board applies Resolution No. 68-16 to promote the maintenance of existing high-quality waters.	Applicable	Applies to groundwater remedial actions.	The Basin Plan water quality objectives and beneficial uses are included as potential ARARs in Section A2.2.1.2 and Table A2-3.

Table 1 (continued)

#	Source	Standard, Requirement, Criterion, or Limitation	Description	ARARs, or To Be Considered	RWQCB Comments	Navy Response
5	Porter-Cologne Water Quality Control Act (California Water Code Sections 13000, 13140, 13263, 13304)	State Water Resources Control Board Resolution No. 68-16 ("Anti-degradation Policy").	Requires that high quality surface and ground waters be maintained to the maximum extent possible. Degradation of waters will be allowed (or allowed to remain) only if it is consistent with the maximum benefit to the people of the state, does not unreasonably affect present and anticipated beneficial uses, and does not result in water quality less than that prescribed in RWQCB and SWRCB policies. If degradation is allowed, the discharge must meet best practicable treatment or control, which must prevent pollution or nuisance and result in the highest water quality consistent with maximum benefit to the people of the state.	Applicable	Applies to discharges of waste to waters, including discharges to soil that may affect surface or ground waters. In-situ cleanup levels for contaminated ground waters must be set at background level, unless allowing continued degradation is consistent with the maximum benefit of the people of the state. If degradation of waters is allowed, or allowed to remain, the discharge must meet best practical treatment or control standards, and result in the highest water quality possible that is consistent with the maximum benefit to the people of the state. In no case may water quality objectives be exceeded.	The Navy and state positions on SWRCB Res. No. 68-16 are included in Section A2.2.1.2.
6	Porter-Cologne Water Quality Control Act (California Water Code Sections 13000, 13140, 13240, 13260, 13263, 13267, 13300, 13304, 13307)	State Water Resources Control Board Resolution No. 92-49 (As amended April 21, 1994)	Establishes requirements for investigation and cleanup and abatement of discharges. Among other requirements, dischargers must clean up and abate the effects of discharges in a manner that promotes the attainment of either background water quality, or the best water quality that is reasonable if background water quality cannot be restored. Requires the application of Title 23, CCR, Section 2550.4, requirements to cleanups.	Applicable	Applies to groundwater remedial actions	The Navy and state positions on SWRCB Res. No. 92-49 have been documented and included in Section A2.2.1.2. There is a disagreement on whether Res. No. 92-49 is an ARAR. However, if a remedial alternative can be agreed upon, the ARAR disagreement can be documented in the ROD and the remedial action can move forward.

Table 1 (continued)

#	Source	Standard, Requirement, Criterion, or Limitation	Description	ARARs, or To Be Considered	RWQCB Comments	Navy Response
7	Porter-Cologne Water Quality Control Act (California Water Code Sections 13000, 13140, 13240)	State Water Resources Control Board Resolution No. 88-63 ("Sources of Drinking Water Policy") (as contained in the RWQCB's Water Quality Control Plan)	Specifies that, with certain exceptions, all ground and surface waters must have the beneficial use of municipal or domestic water supply.	Applicable	Applies in determining beneficial uses for waters that may be affected by discharges of waste.	This resolution has been included in Section A2.2.1.2 and Table A2-3 as a potentially applicable state ARAR.
8	Drinking Water Act (California Health & Safety Code Section 4010 et seq.)	Title 22, CCR, Section 64400 et seq.	Requirements for public water systems. Includes Maximum Contaminant Levels (MCLs) and Secondary Maximum Contaminant Levels (SMCLs).	Relevant and Appropriate	The act is legally applicable for an aquifer and associated distribution and pre-treatment system that is currently defined as "public water system" If it is only a potential "Public water system," then the act is relevant and appropriate.	The state MCLs have been included in the ARARs evaluation in Section A2.2.1.2 and Table A2-3. The Navy has determined that the MCLs at Cal. Code Regs. tit. 22, § 64,444 for cis- and trans-1,2-DCE; vinyl chloride; and 1,1-DCA are potential state ARARs for the inland groundwater since they are more stringent than the federal MCLs. However, the Navy has determined that MCLs are not a potential ARAR for shoreline groundwater, since the shoreline groundwater meets the exemption criteria and should not be considered a potential drinking water source.

Table 1 (continued)

#	Source	Standard, Requirement, Criterion, or Limitation	Description	ARARs, or To Be Considered	RWQCB Comments	Navy Response
9	Staff Report of the RWQCB, Central Valley Region	"A Compilation of Water Quality Goals"	Provides guidance on selecting numerical values to implement narrative water quality objectives contained in the Basin Plan.	To Be Considered	Performance Standard. To be considered in selecting appropriate numerical values to implement the Basin Plan for setting cleanup levels and discharge limits. The numerical values contained in the staff report may be ARAR's, or Performance Standards, depending on the source of the values.	A compilation is not needed, since there are adequate ARARs identified for this action.

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